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a quarterly journal of

PLANNING, HOUSING & PUBLIC UTILITIES

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Jane Kennedy

Capital Costs of Private vs. Public Power for AEC: A Review
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Lee M. James and *James G. Yoho*

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Development of Postal Rates: 1845-1955†

By JANE KENNEDY*

THE United States Post Office is both a publicly-owned transportation business and a very old, tradition-bound agency of the federal government. This article will describe the development of postage rates for the four chief classes of domestic mail which account for most of the postal business. Briefly defined, those four mail classes are: first class, letters and postcards (only postage on non-local letters will be dealt with here); second class, newspapers and magazines; third class, advertising circulars and miscellaneous articles under ½ pound in weight; fourth class, parcel post. What does the history of postage for the four mail classes reveal as to the government's rate-making policy for this publicly-owned enterprise? The answer may be summarized briefly here: postal rate policy is primarily the outcome of the (at least) century-old Congressional practice of using the Post Office to accomplish all sorts of social and political objectives extraneous to the business of mail delivery.

The direction of the Post Office is chiefly in the hands of two Congressional Committees, the Senate and House Committees on Post Office and Civil Service. Their method of managing postal affairs is to hold public hearings on the many facets of the business—postage rates, pay of employees, matters relating to transportation[1]—and then to present legislation to the entire Congress for consideration.[2] Hence, the history of postal rates is largely composed of changes in legislation, the debates accompanying them, records of Committee hearings, and Congressional and Post Office documents.

In the discussion following, Part I will outline the major changes in postal rate legislation since the early part of the nineteenth century, showing where possible what were the most important determinants of major rate changes for each class of mail. Part II will present some aspects of the chronic postal deficit —the long-term financial result of Congressional policy toward both postal rates

† The author is indebted to Professor George Stigler for suggesting improvements in the manuscript, and also for originally giving her the idea of making a study of the Post Office.

* New York City.

[1] The Interstate Commerce Commission sets the actual rates of mail pay to railroads; the Civil Aeronautics Board, to airlines.

[2] It may be surprising to one unfamiliar with postal affairs to realize that, even in so seemingly small a matter as the price of post cards, action must be taken by Congress before the rate can be changed. There is one exception to Congressional determination of postal rates: the Postmaster General may change parcel post rates by executive order. However, Congress may, and does, still change these rates also.

and expenditures. In the 1850's and 1860's, the combination of large reductions in postage and the rapid westward expansion of the postal service brought the first large postal deficits into being, and also the beginning of a debate that continues today: whether the Post Office should be managed on a "business" basis, or whether its deficit should be regarded as the price of its contribution to national welfare.

Part I: Major Changes in Postal Rates

General Chronology. The history of American postage can be divided into three periods: (1) From 1782 to 1845 the Post Office carried over from Colonial times a rate schedule for letters patterned on that of the English Post Office. (2) From 1845 to 1917 letter postage was revolutionized, the special "pound" rate for newspapers and magazines was inaugurated, four classes of mail emerged and were formalized by law, and in sum the basis of the modern system of postal rates was established. Much of this had been accomplished by 1879. Two major developments thereafter were the enlargement of fourth class mail to a general parcel post in 1912 and the introduction of special postage rates for the advertising portions of newspapers and magazines in 1917. (3) From 1917 to date the general rate structure developed in the second half of the nineteenth century and through the first World War has remained substantially the same. The outstanding addition to rate policy has been the attempt to link postage rates to a controversial system of cost allocation. The last decade has seen Post Office Department attempts to raise rates in order to cover mounting costs resulting from the war inflation. Congressional rate policy has not shared this aim, judging by the very large deficits on postal operations in recent years.

Development of Postage on Letters, 1845-1955. There appear to be two factors that have most influenced the development of letter postage: (1) the government's legal monopoly of letter mail, and (2) the Post Office's role in western expansion in the second half of the nineteenth century. The recorded history of letter postage in the United States consists in great part of the important change in the structure of letter rates and the whole method of handling letter mail which occurred in 1845, and which was attended by a series of debates on the Post Office monopoly and pricing policy among postal and Congressional authorities.

The first law dealing with the Post Office under an American government, in 1782, provided for the government's monopoly on letter mail.[3] The monopoly was probably adopted because it was a feature of the English postal system, on which the American Post Office was modeled. Government monopolies of mail service apparently have been based on two advantages of such control: (1) the opportunity for espionage on citizens' correspondence; and (2) the profitability of postal operations as a source of state revenue.[4] The creation of the English postal monopoly in 1609 had as its "avowed object . . . . that the State might possess the means of detecting and defeating conspiracies against itself."[5]

The first American letter postage schedule was modeled on the English system of rates. Letters in both countries were charged by the number of sheets, and were zoned expensively. In the

[3] Wesley E. Rich, *History of the American Post Office to 1829* (Cambridge: Harvard University Press, 1924), pp. 56-57; U. S. Post Office Department, *Postage Rates, 1789-1930, Abstract of Laws* (Washington: Government Printing Office, 1930), p. 1.

[4] Laurin Zilliacus, *Mail for the World* (New York: John Day, 1953), pp. 130, 144.

[5] Herbert Joyce, *History of the Post Office* (London: Richard Bentley and Son, 1893), p. 7.

United States, in the 1840's, the rates ranged from 6 cents for 30 miles, up to 25 cents for 400 miles or greater distances, for a "single" letter consisting of one sheet of paper. Stamps and envelopes were not used—an envelope would have counted as another "sheet" and postage would have been doubled—and postage was collected on delivery, often with arguments as to the number of sheets and the correct postage, and with necessary prying by postal clerks in order to apply the rates.[6]

The old system was revised in the 1840's in both England and the United States. The postal changes in both countries were part of much wider changes that were taking place concurrently—in England, the Reform Movement; in the United States, the great improvements of transportation and the rapid increase of commerce.

Rowland Hill, the instigator of postal reform in England, publicized his ideas in 1837 in a pamphlet, *Post Office Reform: Its Importance and Practicability.*[7] He recommended a uniform postage of one penny regardless of distance, for "primary distribution" of ½-ounce letters and papers, and also proposed prepayment of postage and the use of stamps. "Primary" (city) mail would pay the overhead costs of the entire postal service, while the "secondary" (country) mail would pay for its own local costs of distribution. This evidently meant, in effect, an extra charge for rural delivery.[8]

In January 1840 uniform penny postage was put into effect in England. (Hill's proposals regarding rural mail were disregarded because they were felt to be impractical).[9] The English reform, which led to demands for a similar change in the American system,[10] coincided with the building of the first railroads in the United States.[11] In the early 1840's receipts at post offices located on recently built railroad lines declined, because "private expresses" were carrying mail on the railroads in violation of the Post Office's legal monopoly. The rise of competition was especially important in New York and New England.[12] The Postmaster General called for a strengthening of the laws enforcing the monopoly and in 1843 he had Adams and Company, one of the expresses, prosecuted, and lost the case. The court held that the existing law, passed in a different era of transportation, did not cover violations by railroads and "private expresses."[13] In several cases of this kind, prosecutions by the Post Office were unsuccessful.[14]

In spite of developing criticisms of the postal monopoly, postal officials were not enthusiastic about rate reduction, holding that the English example was not a justification for a like reduction in the United States, with its huge territory and sparse settlement.[15] The Department particularly opposed adoption of a universal flat rate simply to meet competition in the East, and defended the

[6] Howard Robinson, *The British Post Office, A History* (Princeton: The Princeton University Press, 1948), pp. 137, 154-157, 256n.; A. D. Smith, *The Development of Rates of Postage* (London: George Allen and Unwin, 1917), pp. 338-339; Alvin Harlow, *Old Post Bags*, (New York: D. Appleton and Company, 1928), pp. 325, 396-397; and Marshall Cushing, *The Story of Our Post Office* (Boston: A. M. Thayer and Co., 1893), p. 494.

[7] A. D. Smith, *op. cit.*, p. 23; Robinson, *op. cit.*, pp. 264-267.

[8] Rowland Hill, *Post Office Reform: Its Importance and Practicability* (London: privately printed, 1837), pp. 11, 46-47. See also the third edition (London: Charles Knight and Co., 1837), p. 38.

[9] Robinson, *op. cit.*, pp. 270, 322-323.

[10] *Annual Report of the Postmaster General*, 1842, p. 724. *Annual Reports* hereafter referred to as *ARPG*.

[11] Edward C. Kirkland, *A History of American Economic Life* (rev. ed.; New York: F. S. Crofts and Co., 1946), pp. 255-292.

[12] *ARPG*, 1840, p. 480; *ARPG*, 1842, p. 724.

[13] *ARPG*, 1843, p. 596. Adams became one of the four leading express companies in the country. The four were merged in 1918 to become what is now the Railway Express Agency. (Russell E. Westmeyer, *Economics of Transportation* [New York: Prentice-Hall, 1952], p. 664).

[14] 28th Congress: 1st Session, *House Document 213*, 1844, p. 2; 28th Congress: 1st Session, *Senate Document 66*, 1845, p. 4.

[15] *ARPG*, 1843, pp. 596, 600; *ARPG*, 1844, pp. 670, 673.

existing system of rates and the letter monopoly as necessary to pay for the expensive southern and western mail routes.[16]

The reduction in rates that was finally put into effect in 1845, after several years of debate, was evidently a compromise between the groups that favored a 5-cent rate for all mail routes, and those groups (Post Office officials and some southern legislators) that wanted a much less radical change, or no change at all. The new rates were also specifically intended to take care of the range of distances within which the Post Office suffered the most competition.[17] The law of 1845 also prohibited the carriage of letter-mail by private expresses, thus extending the scope of the postal monopoly.[18] In 1847 postage stamps were introduced and in 1855 prepayment of letter postage was made compulsory.[19]

Further great reductions were made in the non-local letter rate in the next four decades. As mail routes to the Pacific territories were opened up, special letter rates to the Far West were introduced. In 1850 the Senate and House Post Office Committees both recommended low flat rates of postage to benefit the frontier population, to disseminate knowledge, and to spread literacy.[20] In 1851 these recommendations were put into effect with 3-cent postage for all destinations except the Far West. Thus the low flat rate which had been so strongly opposed by the Post Office Department a few years earlier became law—and apparently, with very little preliminary discussion. By 1863 the distinction between Pacific mail and other mail was no longer drawn in the rates, and all non-local letters went to any place on the continent for 3 cents per ½-ounce. The 1883 reduction to 2 cents per ½-ounce was made with the brief explanation that letters had received the "least favor" in postal legislation for many years, and that the government should not use its monopoly to place an unfair share of postal costs on letters.[21]

The Post Office's letter monopoly has figured in other periods of postal history. The extension of city mail delivery in the 1860's and the introduction of special delivery of letter mail in the 1880's were evidently forced (or at least hastened) by competition from private letter mail companies.[22] The most recent incident of importance involving the government monopoly took place in 1932 when postage on both local and non-local letters was raised to 3 cents. The occasion was the large increase in the postal deficit brought on in part by the depression and in part by Congress's own rate policy in the 1920's (particularly reductions in postage on second, third and fourth class mail in 1928). The 1932 rise in letter rates was based squarely on the postal monopoly (the Postmaster General erroneously arguing that an increase would not drive customers away from this class of mail) and was made in spite of the fact that the Post Office's cost accounting system showed a large profit on first class mail, and large losses on the second, third and fourth classes. After the increase, banks, utilities, and other businesses began the practice of hiring Western Union messengers to deliver their local correspondence, taking advantage of a loophole in the "private express" statutes. Congress reduced the local letter rate back to 2 cents in 1933 and later tightened the monopoly laws further, to take

[16] *ARPG*, 1843, p. 598; 28th Cong.: 1st Sess., *House Report 483*, 1844, p. 5.

[17] 28th Cong.: 2nd Sess., *Congressional Globe*, XIV (1845), 196-197; 28th Cong.: 1st Sess., *Senate Report 137*, 1844, p. 1.

[18] Harlow, *op. cit.*, p. 333.

[19] U. S. Post Office Department, *Postage Rates, 1789-1930*, p. 8.

[20] 31st Cong.: 1st Sess., *Senate Report 148*, 1850, pp. 4-5; and *House Report 411*, 1850, pp. 1-5.

[21] 47th Cong.: 2nd Sess., *House Report 1816*, 1882, p. 8.

[22] *ARPG*, 1860, pp. 443, 525; *ARPG*, 1883, pp. 25-27.

account of the most recent type of violations.[23]

Development of Postage on Newspapers and Magazines: 1845-1955. Among the factors that have influenced the development of newspaper and magazine postage, three important ones are: (1) the need to use the Post Office as a means of communication and of the dissemination of knowledge for a widely scattered population in a new country; (2) the lobbying of newspaper and magazine publishers; (3) Congress's desire to give favorable treatment to the press. This desire apparently took two forms: (a) the practical partisan objective of giving direct aid to party newspapers; (b) favor for the press due to fear of its power to influence public opinion.

In the early nineteenth century, newspapers were carried at a rate of 1 cent for 100 miles, 1-½ cents for greater distances; whereas a letter containing only 1 sheet had to pay 12-½ cents postage for 100 miles, up to 25 cents for greater distances. It has been claimed that without the aid of the Post Office, in the form of low postage, western newspapers could hardly have existed.[24] The Post Office was frequently described in Congress as an instrument of civilization. An early example of this view was that the postal function was "to content the man dwelling remote from towns with his more lonely lot . . . . to prevent those whom the swelling tide of population is constantly pressing to the outer verge of civilization from . . . sinking into the hunter or savage state . . . . to diffuse, throughout all parts of the land, enlightenment, social improvement."[25] Such sentiments, voiced many times through the decades, appear to be the basis even today for the argument that Congress never intended the Post Office to cover costs, but rather intended that it be used for great purposes of national welfare. As recently as 1946 the Post Office was defending itself against this doctrine thus: "The Congress . . . . while providing low second-class rates and even 'free-in-county' service, at a time when economic and social conditions justified such aid, has at no time established *formally* a policy that publications of the second class should be carried in the mails without regard to the cost of handling."[26]

Congress's intent to use the Post Office as enlightener was apparently leavened from the beginning with the need to give wide circulation to party newspapers. In the eighteenth century it was almost the universal custom for Colonial postmasters to be newspaper publishers and to exclude competing papers from the mails. Postmaster General Franklin admitted all newspapers to the mails and established postage for them in 1748.[27] In Jackson's administration many local party papers were subsidized by postmasterships. The editor-postmasters customarily used their franking privilege to send their own newspapers through the mails free.[28] There is some indication, in the brief debate that accompanied the origin of "free-in-county" mailing in 1851 (still in existence today), that the encouragement of rural newspapers favorable to one or both political parties was the reason for the legislation.[29]

Even though the free mailing privilege was at the time officially limited to weekly newspapers in their own county, many other publications were evidently

[23] *ARPG*, 1930, p. 1; 74th Cong.: 1st Sess., House Committee on the Post Office and Post Roads, *Conveyance of Letters by Special Messenger, Hearings . . . . on H.R. 8869*, 1934, pp, 1-3.

[24] Rich, *op. cit.*, p. 29.

[25] 28th Cong.: 1st Sess., *House Report 477*, 1844, p. 2.

[26] Charles A. Heiss, *Report on Second Class Mail* (Washington: Government Printing Office, 1946), p. 72.

[27] Rich, *op. cit.*, p. 29.

[28] Dorothy G. Fowler, *The Cabinet Politician: The Postmasters General, 1829-1909* (New York: Columbia University Press, 1943), pp. 14-16.

[29] 31st Cong.: 1st Sess., *Congressional Globe*, XX (1850), 91.

being mailed free unofficially at this period. Prepayment of letter postage by stamps was made compulsory in 1855, but was not required of newspapers and magazines until 1875. Up to that year, postmasters were supposed to collect newspaper and magazine postage quarterly in advance from the subscribers, but were lax in this duty.[30] A rough estimate by the author is that perhaps 40 percent of newspapers and magazines (other than free-in-county) may not have been paying any postage in 1874.[31] If a large number of publications had grown accustomed to free mailing, this fact alone would be very significant in accounting for nineteenth-century rate changes on this class of mail. The 1851-1852 and 1863 laws probably represented Congressional attempts to grapple with the problem—the 1851-1852 law providing for a 50-percent discount for advance payment of postage by subscribers, the 1863 law discarding the discount (while lowering rates by about the 1852 amounts) and stating that postage must be paid in advance. (See Table I). These laws were passed even though advance payment had been the official rule for many years.[32]

Habitual evasion of postage in the past would also account for what was described as publishers' bitter opposition to the law of 1874, which shifted payment of postage from subscribers to publishers by requiring prepayment by stamps. One Senator charged that the low "pound" rates (which went into effect in 1875) were a "trade" for requiring prepayment by publishers, and described the sharp newspaper attack upon him for his opposition to the low rates.[33]

[30] 43rd Cong.: 1st Sess., *Congressional Record, II*, Part 5 (1874), 4346, 4660, 5347.

[31] See author's Ph.D. thesis, "United States Postal Rates, 1845-1951" (Columbia University, 1955), pp. 41, 46.

[32] 33rd Cong.: 1st Sess., *Congressional Globe*, XXIII, Part 3 (1854), 1673; *ARPG*, 1854, pp. 622-623.

[33] 43rd Cong.: 1st Sess., *Congressional Record*, II, Part 5 (1874), 4660, 5347.

Further great reductions in newspaper and magazine postage were made in 1879 and 1885 in laws which appear to have been passed chiefly for publishers' benefit. The Classification Law of 1879 was the outgrowth of a conference of newspaper, magazine and book publishers which was organized at the invitation of the Chairman of the House Post Office Committee.[34] It tightened the specifications for second-class mail by enumerating the criteria a publication must meet to gain second class entry to the mails (and thus to pay the lowest possible postage), and extended to magazines the same rates and privileges enjoyed by newspapers: the 2-cent pound rate and free-in-county mailing. In a recent Post Office publication the 1879 law was called the "last major revision of mail classification by the Congress."[35] But since three classes of mail had already been designated in 1863, the chief addition to classification in 1879 was the removal of merchandise from third class and its formal establishment as a fourth class of mail at a higher rate of postage.[36] In view of its origin and its accomplishments, the 1879 law was a publishers' law in the most literal sense.

The reduction of second class postage to 1 cent per pound in 1885 was recommended by the House Post Office Committee, which listed two reasons for the cut in postage: one, cheap circulation of the press would bring wider dissemination of knowledge, and two—what was probably the weightier consideration—the 1874 requirement of prepayment of postage had shifted this "tax" from the millions who received newspapers to a few publishers who, it was claimed, had never been able to raise their sub-

[34] 45th Cong.: 3rd Sess., *Congressional Record*, VIII, Part I (1879), 690; *ARPG*, 1878, pp. 51-53.

[35] Heiss, *op. cit.*, p. 4

[36] U. S. Post Office Department, *Postage Rates, 1789-1930*, pp. 9, 13-14.

TABLE I—MAJOR CHANGES IN NEWSPAPER AND MAGAZINE POSTAGE: 1845-1918

A. NEWSPAPERS				B. MAGAZINES			
Rate as Stated in Law		Rate per Copy*		Rate as Stated in Law		Rate per Copy*	
		2 Ounces	*4 Ounces*			*3 Ounces*	*6 Ounces*
1845	1¢ per copy, 100 miles or within state where published 1-1/2¢ per copy greater distances Size limit of 1900 square inches for these rates; larger papers, higher rates	1¢, 100 miles; 1-1/2¢, over 100 miles	5-½¢, any distance	1845	2-1/2¢, first oz., all distances 1¢, each additional oz.	4-1/2¢	7-1/2¢
1851–1852	1¢ per copy, first 3 oz., all distances 1¢, each additional oz. 50% reduction in rate if postage paid in advance	1¢, C.O.D. 1/2¢, advance payment	2¢, C.O.D. 1¢, advance payment	1851–1852	1¢ per copy, first 3 oz., all distances 1¢, each additional oz. 50% reduction in rate if postage paid in advance	1¢, C.O.D. 1-2¢, advance payment	4¢, C.O.D. 2¢, advance payment
1863	5¢ per quarter, weeklies; 10¢ per quarter, semi-weeklies; 15¢ per quarter, tri-weeklies, etc. Weight to which rates applied, 4 oz. No distance limit mentioned Postage required to be paid in advance	2/5¢	2/5¢	1863	1¢ per copy, first 4 oz. 1¢, each additional 4 oz. No distance limit mentioned Postage required to be paid in advance	1¢	2¢
1875	2¢ per lb. Postage required to be paid by purchase of stamps at time of mailing	1/4¢	1/4¢	1875	3¢ per lb. Postage required to be paid by purchase of stamps at time of mailing	3/5¢	1-1/8¢
1879				1879	2¢ per lb.	2/5¢	6/8¢
1885	1¢ per lb.	1/8¢	1/8¢	1885	1¢ per lb.	1/5¢	3/8¢

*The weights of newspapers and magazines used here are drawn from contemporary references. The 2-oz. weight was said to be that of the majority of newspapers in 1874; the average weight of monthly magazines was about 6 ounces.

Sources: ARPG, 1854, pp. 622-623. Charles A. Heiss, *Report on Second Class Mail*, 1946, p. 69. U. S. Post Office Department, *Postage Rates, 1789-1930*, pp. 4-15. 37th Cong.: 3rd Sess., *Congressional Globe*, XXXIII, Part I, 1863, p. 839. 43rd Cong.: 1st Sess., *Congressional Record*, II, Parts 5 and 6, 1874, pp. 4659-4660, 5346.

scription prices to meet their added expenses.[37]

[37] 48th Cong.: 2nd Sess., *House Report 2498*, 1885, pp. 1-2.

In the 3-decade interval until the next rate change in 1917, there developed what came to be called the "second class

mail controversy."[38] Total publishers' paid mail increased from 101 million pounds in 1885 to 1,177 million pounds in 1915. Compared to this approximately 12-fold increase, the volume of letters probably increased 6-to-7-fold in the same 30-year period.[39] The Post Office blamed the second class mail problem on the Classification Law of 1879, claiming that the second class mail criteria were too difficult to administer. The criteria are as follows: A publication must (1) be published regularly at stated intervals, bear a date of issue, and be numbered consecutively; (2) be issued from a known office of publication; (3) be formed of printed paper sheets, without board, cloth, leather or other substantial binding; (4) have a legitimate list of subscribers and not be circulated free of charge; (5) be published for the dissemination of information of a public character or be devoted to literature, the sciences or some special industry, and (6) not be designed primarily for advertising purposes.[40] These criteria, combined with the low second-class postage (the next higher rate offered to postal customers, 8 cents per pound for third class mail, was 700 percent higher) created an "irresistible temptation" to give all printed matter the periodical form. Advertising circulars and novels were being sent through the mail as periodicals.[41]

In 1906, and again in 1911, Congress appointed special commissions for study of the second class mail problem. Both commissions published long reports recommending some increase in second class rates, criticising the Post Office for not knowing the true cost of carrying the different classes of mail, and recommending cost studies as the basis for future rate making.[42] However, the recommendations of its two commissions were not heeded by Congress.

The "second-class mail controversy" flared anew when an increase on second class mail was included in the War Revenue Act of 1917. Postage on the reading portions of newspapers and magazines was raised to 1-½ cents, and an entirely new system of zoned rates for the advertising portions was introduced.[43] The rates went into effect in four installments, beginning in 1918 and ending in 1921. (See Table II). The fourth stage of the war increase probably brought average postage on second class mail to no more than 2 cents per pound, the rate that had been in effect from 1879 to 1885, but it was bitterly opposed by publishers. (The law exempted from zone advertising rates the publications of non-profit associations formed for religious, educational and charitable purposes. The publications of these organizations were charged the flat rate of 1-½ cents per pound, even on their advertising pages. Professional journals are "exempt" publications.)

At the time of the bill's passage, some legislators expressed an almost vengeful satisfaction at the increase on publishers' mail, the chief burden of their speeches being that the war had brought about a long-overdue rise in newspaper and magazine postage which Congress had

[38] 54th Cong.: 2nd Sess., *Congressional Record*, XXIX, Part I (1897), 185; 59th Cong.: 2nd Sess., *House Document 608, Report of the Joint Commission on Second-Class Mail Matter* (Penrose-Overstreet Commission), 1907, p. xxiv; 62nd Cong.: 2nd Sess., *House Document 559, Report of Commission on Second-Class Mail Matter*, (Hughes-Lowell Commission), 1912, p. 66.

[39] See author's Ph. D. thesis, "United States Postal Rates, 1845-1951," Table 6.

[40] *ARPG*, 1905, pp. 76-78.

[41] 59th Cong.: 2nd Sess., *House Document 608* (Report of Penrose-Overstreet Commission), 1907, p. xviii; 60th Cong.: 1st Sess., *Senate Document 270*, 1908, p. 10; *ARPG*, 1905, p. 28.

[42] 62nd Cong.: 2nd Sess., *House Document 559* (Report of Hughes-Lowell Commission), 1912, pp. 62-63, 66; Heiss. *op. cit.*, 48-50, 51-52.

[43] 65th Cong.: 2nd Sess., House Committee on Ways and Means, *Hearings on Proposed Revenue Act of 1918, Part 3, Postal Rates*, 1918, p. 1785.

TABLE II—POSTAGE ON PUBLISHERS' SECOND CLASS MAIL: 1918-1955
(ZONE RATES PER POUND ON ADVERTISING PORTION OF PUBLICATIONS)[1]
cents

Zone[2]	1918[3]	1921	1925	1928	1932	1934–1951	1954[4]
1.....	1.25	2.00	2.00	1.50	2.00	1.50	1.95
2.....	1.25	2.00	2.00	1.50	2.00	1.50	1.95
3.....	1.50	3.00	3.00	2.00	3.00	2.00	2.60
4.....	2.00	5.00	6.00	3.00	5.00	3.00	3.90
5.....	2.25	6.00	6.00	4.00	6.00	4.00	5.20
6.....	2.50	7.00	6.00	5.00	7.00	5.00	6.50
7.....	3.00	9.00	9.00	6.00	9.00	6.00	7.80
8.....	3.25	10.00	9.00	7.00	10.00	7.00	9.10

[1] Rate on reading portion, 1.5 cents per lb., 1918-1951; 1.95 cents per lb. from 1954 to date. Reading matter increases that went into effect in 1918 and 1952 took place in several installments. Total postage on a 1-pound publication containing 50 percent advertising, at 1954 rates, would be: 1.95, 1.95, 2.27, 2.92, 3.57, 4.22, 4.87, 5.52 cents.

[2] Zones cover the following distances:

1	up to 50 miles	5	600—1000	3	150—300	7	1400—1800
2	50—150	6	1000—1400	4	300—600	8	Over 1800

[3] Zone rates went into effect in 4 installments on July 1 of each year from 1918 through 1921. The second and third phases are omitted here.

[4] The increase of 30 percent went into effect in 3 installments on April 1, 1952-1954. Only the last one is given here.

Sources: ARPG, 1952, pp. 62-67; U. S. Post Office Department, *Postage Rates, 1789-1930;* and *Postage Rates, Part II, 1930-1944;* 77th Cong.: 1st Sess., Senate Committee on Post Offices and Post Roads, *To Provide for a Permanent Postage Rate of 1-1/2 Cents per Pound on Books: Hearing on S. 337*, 1941, p. 24.

for years been too cowardly to effect.[44] A typical remark was Representative Garner's explanation to one of his colleagues of the method of handling the second class rate increase: "You have been a member of Congress long enough to realize . . . . that the influence back of second class postage makes it impossible for the [House and Senate Post Office Committees] to pass any such bill, and that therefore the only chance we had was to make it a part of the war revenue bill, which could not be defeated."[45]

Almost immediately after the introduction of the zone advertising rates, publishers organized a campaign to reduce or abolish zone rates. A by-product of their demands was the first formal study, in 1923, of the costs of the various mail classes.[46] Thus, as an outgrowth of decades of controversy over second class postage, the Post Office developed its first allocation of the costs and revenues of the postal services. The cost study became a permanent feature of the postal operations and has been published annually by fiscal years since 1926 (with the exception of one war year, 1943).

A series of three postal rate hearings in the later 1920's (1925, 1926, and 1928) laid the background against which the publishers' lobby conducted its eventually successful efforts to reduce zone advertising rates. The 1925 hearings grew out of President Coolidge's veto of increased pay for postal employees, and his request that higher postal salaries be accompanied by higher postal rates to provide the necessary revenue. The hearings on the proposed postage increases were the first in which the Post Office's new cost accounting system figured. However, while the Cost Ascertainment reported a deficit on second-class mail of $74 million, the Postmaster

[44] 65th Cong.: 1st Sess., *Congressional Record*, LV, Part 2 (1917), 2155; Part 6 (1917), 6419, 6426-6427.

[45] 65th Cong.: 2nd Sess., House Committee on Ways and Means, *op. cit.*, p. 2203.

[46] 67th Cong.: 4th Sess., *Congressional Record*, LXIV, Part 2 (1922), 1147-1148; Part 3 (1922), 2406; 68th Cong.: 2nd Sess., *Senate Document 162*, 1924, p. 2.

General recommended a second class rate increase which, he estimated, would bring in only an additional $10 million revenue.[47] Nonetheless, publishers attacked the Cost Ascertainment as a basis for rate-making, asserting that the postal salary increase should not be tied to any postage increase on second class mail. They criticized the zone advertising rate system and asked that these rates be reduced.[48] The resulting 1925 legislation left second class rates virtually untouched while increasing rates on other mail classes. (A peculiar feature of the 1925 rate legislation, and one which well demonstrates the anomalies of Congressional rate-making for the Post Office, was that it raised postage on privately-manufactured post cards from 1 cent to 2 cents, while leaving the rate on government post cards at 1 cent. This provision of the law, which reportedly played havoc with the private post card business, was eventually repealed in 1928.)[49]

The 1925 rate law also appointed still another commission to investigate rates, the Special Joint Subcommittee on United States Postal Rates, which held hearings all over the country for one and a half years, through December 1926. The published record of the hearings amounted to 1,752 pages, but the Subcommittee was unable to agree on any substantive recommendations for postal rate policy. At these extraordinarily lengthy proceedings, publishers were represented by the American Publisher's Conference, which was a consolidated group composed of the leading general magazines and trade papers, and the small daily and weekly newspapers; and by the American Newspaper Publishers' Association (the large metropolitan dailies). Both the Publishers' Conference and the American Newspaper Publishers' Association asked for a return to the zone advertising rates of 1920, by which they meant the second in the 4-step increase effected by the War Revenue Act of 1917. They wanted this particular rate schedule because advertising rates in the first two zones of the 1920 schedule were 1-½ cents, the same as the rate on the reading portions.[50]

Although no action was taken on the 1926 hearings, another set of rate hearings was held in 1928. The two large publishers' organizations again appeared and asked for a return to the 1920 zone rates.[51] The legislation which resulted restored the 1920 zone rates in the first four zones, and in the last four zones set rates which were a "compromise" between the 1920 and the 1921 rates.[52] The 1928 reduction of second class postage was substantially what the publishers had lobbied for over a period of about seven years.

With the exception of a temporary depression increase in 1932-1934, second class rates remained unchanged from 1928 to 1952. In 1952, Congress imposed a 30-percent increase as part of the series of postwar increases on all mail classes due to rising costs and the rapidly expanding postal deficit. The 1952 increase took place in three installments, ending in April 1954. In fiscal 1955, according to the Post Office's Cost Ascertainment, the average revenue per pound of second class mail was 2.30

[47] 68th Cong.: 2nd Sess., Senate Committee on Post Offices and Post Roads, *Postal Rates: Hearings on S. 3674, a Bill Relative to Salaries . . . . of Post Office Employees and an Increase of Postal Rates*, 1925, pp. 1-3, 286. (Hereafter referred to as *1925 Rate Hearings.*)

[48] *Ibid.*, pp. 104, 192, 238, 258, 267.

[49] Special Joint Subcommittee on U. S. Postal Rates, *Postal Rates: Hearings*, 1926, p. 555. (Hereafter referred to as *1926 Rate Hearings.*)

[50] *Ibid.*, pp. 308, 1375-1376; "Slight Hope for Lower Postal Rates," *Printers' Ink*, December 23, 1926, 49-52.

[51] 70th Cong.: 1st Sess., House Committee on the Post Office and Post Roads, *Regulating Postal Rates: Hearings on H.R. 9296*, 1928, p. 108. (Hereafter referred to as *1928 Rate Hearings.*)

[52] "Postal Bill Approved by Congress," *Printers' Ink*, May 31, 1928, p. 24.

cents, and the average revenue per piece was .88 cent. (Average weight per piece of second class mail was about 6 ounces.)

Development of Postage on Third and Fourth Class Mail: 1845-1955. Important influences on third and fourth class postage rates have been the lobbying of a group of overlapping interests composed of mail order retailers, seed producers, farmers' organizations, book publishers, and direct mail advertisers. The influences of the various groups are are not distinct; and the question has often arisen, in the case of parcel post, whether the farmer's welfare was used as an excuse to give benefits to commercial interests. There is one factor present in parcel post rate-making which evidently does not exist for other classes of mail: namely, an interest which sometimes successfully *opposes* lower rates or extensions of service. The Railway Express Agency has often appeared at rate hearings to protest "unfair" competition of parcel post.

Little has appeared about third class mail in public records, perhaps because third class rates have never undergone any very great change, and indeed have been remarkable for their stability. The basic rate of 1 cent for 2 ounces was maintained over half a century, from 1872 to 1925. (See Tables III and IV.) In its role as a residual class of mail, third class in the 1860's and 1870's included not only advertising circulars and other miscellaneous printed matter that was neither letters nor periodical publications, but also books, seeds and cuttings mailed to farmers, and small parcels up to 4 pounds in weight. In 1879 the Classification Law placed merchandise parcels into a new fourth class of mail which was initially charged higher rates than third class. There are indications that, thereafter, books and seeds were shifted back and fourth between third and fourth class whenever a lower postage would result.

TABLE III—DEVELOPMENT OF THIRD AND FOURTH CLASS POSTAGE: 1863-1914*

	Third Class (Upper Weight Limit 4 lb.)	*Fourth Class* (Upper Weight Limit 4 lb. from 1879 to 1912)
1863	2¢ per 4 oz.	
1872	Circulars, pamphlets, miscellaneous printed matter, seeds, cuttings, etc., 1¢ per 2 oz. Books and merchandise, 2¢ per 2 oz.	
1874	1¢ per 2 oz., all of third class	
1879	Contents of third class redefined as circulars, miscellaneous printed matter, and books, 1¢ per 2 oz.	Merchandise, seed, cuttings, etc. set aside in new fourth class of mail, 1¢ per oz.
1888	Seeds, cuttings, plants, etc., returned to third class at 1¢ per 2 oz.	
1913		Zone system of rates based on weight and distance introduced, weight limit raised to 11 pounds (See Table V)
1913–1914	Seeds, cuttings, plants, and books weighing 8 ounces or less continued in third class at 1¢ per 2 oz.	Seeds, cuttings, plants and books weighing more than 8 oz. included in fourth class at zone rates.

* Third class was first specifically named as a class in 1863. At that time it was defined as "all other mailable matter"—outside of first and second class. Fourth class was first specifically named as a class in 1879, when it was defined to include all matter not embraced in first, second or third class. However, many of the items that were grouped into these classes at these dates were accepted in the mail before 1863: in 1845, printed circulars, handbills, and advertisements; in 1852, books; in 1861, maps, engravings, seeds and cuttings, merchandise.

Sources: U. S. Post Office Department, *Postage Rates, 1789-1930;* 54th Cong: 2nd Sess., *Senate Report 1517,* 1897, p. 181.

The history of third class rates in the modern era centers on the 1925-1928 period, when a group of third class mail users formed an organization to campaign against the first increase in third class postage in more than 50 years. The important legislation of 1925, which has been described in the section on second

class mail, raised rates on all classes of mail (or parts of them) in order to meet President Coolidge's request for higher postal revenues to cover increased postal wages, and was also the first rate legislation in which the Post Office's new system of cost allocation played a part. In the preliminary hearings on the 1925 rate increase, the Direct Mail Advertising Association objected to the Post Office's recommendation that users of third class mail pay a larger percentage share of their allocated deficit than was requested for second class mail.[53] In spite of this protest, Congress put through a 50-percent increase on third class mail (except for books, catalogs and seeds, which continued at 1 cent per 2 ounces), and scarcely touched second class zone rates. (See Table IV.)

TABLE IV—POSTAGE ON THIRD CLASS MAIL, 1914-1955[1]

	Miscellaneous Printed Matter, Circulars, Merchandise, etc.	*Books, Catalogs, Seeds*[2]
1914	1¢ per 2 oz.	1¢ per 2 oz.
1925	1-½¢ per 2 oz.	1¢ per 2 oz.
1928	1-½¢ per 2 oz.	1¢ per 2 oz.
	Bulk rates of 12¢ per lb. for identical pieces in lots of not less than 20 lb. or 200 pieces, minimum charge of 1¢ per piece	Bulk rates of 8¢ per lb., same conditions
1949	2¢ for first 2 oz., 1¢ each additional oz.	1-½¢ per 2 oz.
	Bulk rate, 14¢ per lb.; minimum, 1¢ per piece	Bulk rate, 10¢ per lb; minimum 1¢ per piece
1952	No change	2¢ for first 2 oz., 1-½¢ for each additional oz.
	Minimum for bulk mailings, 1-½¢ per piece	Minimum for bulk mailings, 1-½¢ per piece

[1] The upper weight limit of third class mail was reduced from 4 lb. to 8 oz. in 1925. Thereafter, merchandise over ½ lb. in weight was part of parcel post.

[2] Books were given a special book rate in 1938, catalogs a special rate in 1939. The book rate, from 1938 to 1944, was lower than the third class rate for an 8 oz. book. (See Table VI). The special catalog rate has not been cheaper than the third class rate for an 8 oz. catalog.

Sources: U. S. Post Office Department, *Postage Rates, 1789-1930.* U. S. Post Office Department, *U. S. Official Postal Guide, Part I, Domestic,* July 1949, p. 20; *ARPG,*, 1952, p. 62.

[53] *1925 Rate Hearings,* pp. 286, 307.

As a result of what they regarded as "unjust and discriminatory" postage legislation, third class mail users met in the spring of 1925 to found a new organization known as the National Council of Business Mail Users. Included in the Council were the Direct Mail Advertsiing Association, American Photo Engravers' Association, Envelope Manufacturers, Postcard Manufacturers, National Industrial Advertisers, Seed Association, Association of National Advertisers, United Typothetae of America, and United States Chamber of Commerce.[54] They agreed to work for restoration of the 1 cent private postcard and the 1 cent rate for third class mail, for reductions in parcel post rates, for C.O.D. return mail, and for a provision in postal laws that free-in-county and "exempt" second class publications should be provided for by subsidies and not charged to the Post Office, and that government agencies should provide for their free mail in their own budgets. To carry out its campaign, the newly formed Council of Business Mail Users authorized a budget of $250,000.[55]

The Council appeared at postal rate hearings of the Special Joint Subcommittee in 1925-1926, and again at regular Post Office Committee hearings in 1928. The striking outcome of the rate legislation which Congress finally passed in 1928 was that it incorporated, in some form, every point in the Council's program. Most important, third class rates were lowered by the introduction of "pound" rates, which in effect restored the 1-cent rate for pieces mailed in bulk.[56]

Third class postage rates were not changed for another 20 years, but they

[54] "Chicago Conference Starts Postal Revision Move," *Printers' Ink,* April 23, 1925, p. 57.

[55] "Plan $250,000 Budget in Fight for Lower Postal Rates," *Printers' Ink,* June 18, 1925, pp. 112-113.

[56] "Postal Bill is Approved by Congress," *Printers' Ink,* May 31, 1928, p. 24.

have shared in the series of postwar increases on all classes of mail. The 1952 increase, by raising the 1-cent minimum charge for bulk mailings by 50 percent, has finally taken away the penny rate that this class enjoyed throughout most of its existence.

Enlargement of the fourth class of mail to a general parcel post was apparently a by-product of rural free delivery, which the Post Office had begun on a small scale in 1896. In the 13-year period from 1897 to 1910, rural route mileage increased from 2,000 miles to 990,000 miles, and annual expenditures rose from $15,000 to $37 million.[57] During the 1900's The Postmasters General frequently reported that full use could not be made of the new service because of the exorbitant rates on packages (1 cent per ounce, or 16 cents per pound, for all distances). At first, rural carriers were allowed to carry on a sort of private express business on the side, but the Post Office had to discontinue this practice, apparently for fear that mail and revenues were being illegitimately diverted to the carriers' private delivery business while they were at the same time being paid salaries by the government.[58]

Although the parcel post law of 1912 (effective in 1913) was without doubt a very favorable development for the large mail order firms, the generally claimed purpose of the legislation at the time was to enable farmers to move their products to the cities.[59] Montgomery Ward and Sears Roebuck "gave no overt support to the parcel post bills."[60] The two companies had been flourishing for years before the introduction of parcel post, sending their goods mostly by express or by freight.[61]

Almost immediately after it was established in 1913, the parcel post was enlarged by a series of executive orders of the Postmaster General, who raised weight limits and reduced postage in most zones. By 1914 the original 11-pound weight limit had been increased to 50 pounds in zones 1 and 2, and to 20 pounds in all other zones.[62] (See Table V). In later years the weight limit was raised to 70 pounds for all zones.

TABLE V—POSTAGE ON AN AVERAGE PARCEL: 1913-1955: SIX-POUND PARCEL, ZONE 4 (300-600 MILES) *

1913	38¢
1914	27¢
1925	29¢
1928	28¢
1932	27½¢
1944	28½¢
1949	36½¢
1951	42¾¢
1953	58½¢

* The average weight of parcels in fiscal 1955 was about 5-½ lb., the average haul of fourth class mail was 592 miles. (U. S. Post Office Department, *Cost Ascertainment Report*, 1955, p. 57, 76.)

Sources: United States Post Office Department, *Postage Rates, 1789-1930;* and *United States Official Postal Guide*, July 1914, 1925, 1928, 1932; *Part I, Domestic*, July 1947, July 1949; *ARPG*, 1952, p. 63.

There have been many complaints that the original purpose of the parcel post has not been achieved. As early as 1915 a very critical Senate report claimed that the Postmaster General's recent enlargement of the new class of mail had principally benefited the large mail order retailers who were patronizing the new service to a far greater extent than all other users combined. The parcel post had failed to "justify the predictions made for it as a means of direct transportation from the farm to the consumer."[63] The dispute regarding its beneficiaries has

[57] *ARPG*, 1952, p. 205.

[58] *ARPG*, 1908, pp. 10-12, 318-319; *ARPG*, 1909, pp. 352-353; *ARPG*, 1910, pp. 10, 343.

[59] Ross A. McReynolds, "United States Postal Development, 1607-1931, Summary and Interpretation," Abstract of Unpublished Ph.D. Dissertation, University of Chicago, 1937, p. 31; *ARPG*, 1914, pp. 12-13.

[60] Boris Emmet and John Jeuck, *Catalogues and Counters, A History of Sears, Roebuck and Company* (Chicago: University of Chicago Press, 1950), pp. 187-189.

[61] *Ibid.*, pp. 20, 22, 25-36.

[62] U. S. Post Office Department, *Postage Rates, 1789-1930*, pp. 19, 23.

[63] 63rd Cong.: 3rd Sess., *Senate Document 944, Report of Joint Committee to Investigate the General Parcel Post*, 1915, pp. 5-7, 22-23, 28.

continued through the years.[64] Judging by number of appearances at the three series of rate hearings in 1925-1928, the American Farm Bureau Federation brought more direct pressure in behalf of lower parcel rates than did the two largest mail order houses. Both groups wanted the 2-cent (Coolidge) increase of 1925 repealed, even though the increase exempted parcels that were mailed on rural routes.[65] The 1928 postal rate law, which lowered rates on second and third class mail, also reduced parcel rates by 1 cent in the last five zones, and continued to give a discount to parcels that were collected on rural routes. This discount, in some form, remained as a part of the parcel post rate schedule until 1949.

Since the last decrease in parcel post rates in 1928, the rates have been raised five times: twice by legislation—1944 and 1949—and three times by executive order of the Postmaster General—1932, 1951, and 1953 (The 1932 change increased rates on small parcels but lowered rates on larger parcels mailed long distances.) In 1952, evidently as the result of direct pressure by the railroads, Congress reduced weight limits from 70 to 40 pounds for parcels mailed at city post offices. At hearings on the bill, the president and vice president of the Railway Express Agency, speaking in favor of the weight reductions, claimed that their business had suffered since the end of the war and attributed this to the low rates and unfair competition of parcel post. The law was passed in spite of the objections of Sears Roebuck and other mail order firms that they were willing to pay higher postage but wished the 70-pound weight limit maintained.[66] By fiscal 1955 the volume of parcel mail had declined sharply from 1951: 25 percent by weight and 9 percent by number of pieces.[67] However, since the combined effect of the 1951 and 1953 postage increases amounted to 60 percent (on an average parcel of 6 pounds), the recent decline in the parcel post business is not entirely attributable to the new weight limits.

Note on the Introduction of the Special Book Rate. In 1938 books were taken out of the general parcel post and given a special rate. The background of the changes in the book rate (Table VI) is very complex. The National Book Publishers' Association appeared at the three sets of rate hearings during the 1920's: in 1925 to protest the 2-cent rate increase on parcel post; and in 1926 and 1928 to ask that books be taken out of parcel post and put into a fifth class of mail at a special low rate of 2-½ cents per pound. Among the 65 members of the Association were such well-known publishers as D. Appleton and Company, Brentano's, Columbia University Press, Doubleday, Harper, Macmillan, McGraw Hill, the University of Chicago Press, and the Viking Press.[68]

No action was taken on a special book rate at that time, but the groundwork for the decrease of 1938 was laid in special legislation in 1933, when Congress gave the President power to modify postal rates by proclamation. The purpose and motivation of the law are not clear. From the discussion about it, it may be concluded that it was simply part of the spirit of the time—part of the rush of "emergency" legislation in the early days

[64] 68th Cong.: 2nd Sess., *Congressional Record*, 1925, p. 4649; 82nd Cong.: 1st Sess., House Committee on Post Office and Civil Service, *Readjustment of Size and Weight Limitations on Fourth Class (Parcel Post) Mail: Hearings*, 1951, pp. 2, 24-29.

[65] *1926 Rate Hearings*, pp. 858-865, 954; *1928 Rate Hearings*, pp. 230-237.

[66] 82nd Cong.: 1st Sess., House Committee on Post Office and Civil Service, *op. cit.*, pp. 2, 24-29.

[67] U. S. Post Office Department, *Cost Ascertainment Report: 1955* (Washington: Government Printing Office, 1956), pp. 118, 120.

[68] *1925 Rate Hearings*, pp. 383-385; *1926 Rate Hearings*, pp. 298-299, 1584; *1928 Rate Hearings*, pp. 270-287.

of the New Deal.[69] The interesting result of it was that the President used his power in 1938 to proclaim a special flat rate of 1-½ cents per pound for books, in the interests of the "cultural growth, education and development of the American people."[70]

TABLE VI—BOOK POSTAGE, 1938-1955

Before 1938	If 8 ounces or under, third class rate of 1 cent per oz., or bulk rate of 8 cents per lb. If over 8 ounces, parcel post rates, ranging from 7 to 15 cents for a 1 lb. book in zones 1 to 8
1938	1½ cents per lb.
1942	3 cents per lb.
1944	4 cents per lb.
1949	8 cents for first lb., 4 cents each additional lb.

Sources: U. S. Post Office Department, *Postage Rates, 1789-1930*: and *Postage Rates, Part II, 1930-1944.* 77th Cong: 1st Sess., Senate Committee on Post Offices and Post Roads, *To Provide for a Permanent Postage Rate of 1½ Cents per Pound on Books: Hearings on S. 337*, 1941, p. 24.

The rate was renewed through June 30, 1942, in three subsequent proclamations. When the President's power to modify postage rates by proclamation expired in 1941, Congress wrote the special book rate into permanent law, but raised it to 3 cents per pound. The special rate for books was continued over the protests of Railway Express, which had lost much of its book business, and of the National Council of Business Mail, which did not want the postal deficit on books to be added to that for fourth class mail.[71]

[69] 73rd Cong.: 1st Sess., *Congressional Record*, XXVII, Part 2 (1933), 2022, 2204-2206, 2031. Republican Representatives and Senators objected to the granting of these "extraordinary powers." Senator Vandenberg wanted the law to read that the President had the authority to "reduce" rates rather than to "modify" them, because to put the power to raise second class rates in the hands of the President "would put the power in the hands of one man to dictate the destiny of the press." Democrats defended the legislation on the ground that it was an "emergency measure"; that the House and Senate had never had the "intestinal fortitude" to adjust postal rates. "Now, let us give a chance to someone who will do it." They added that power to change rates would be in the hands of an administrative department which would not be subjected to the pressures that are usually brought to bear in the matter of rates.

[70] 77th Cong.: 1st Sess., Senate Committee on Post Offices and Post Roads, *To Provide for a Permanent Postage Rate of 1½ Cents per Pound on Books: Hearing on S. 337*, 1941, pp. 10, 21, 55.

[71] *Ibid.*, pp. 26, 66; U. S. Post Office Department, *Postage Rates, Part II, 1930-1944*, pp. 6-8.

Part II: Some Aspects of the Postal Deficit

Low flat rates of postage became a characteristic feature of Post Office policy in the nineteenth century. So also did rapidly increasing expenditures (often on non-postal objectives), the mass political appointments of postal employees,[72] and the chronic deficit. From fiscal 1840 through 1848 postal expenses and receipts were almost equal and almost stationary, varying from about $4 million to $4.5 million. Deficits, in most of these years, were about 2 to 4 percent of expenditures.[73] In the five years from 1848 to 1853 expenses increased by 85 percent, while revenues rose by 13 percent. A decade after 1848, expenses had climbed 200 percent, receipts 63 percent. During the 1850's and through 1862, deficits amounting to 30, 40 and 50 percent of expenditures were reached. The postage rate changes behind these new and startlingly large deficits have been described. On the expenditures side, the use of the Post Office as an instrument of western expansion in the mid-nineteenth century also contributed heavily to the deficit.

The Post Office as Nation-Builder. Through the development of the overland mail routes, the postal service was used as a line of communication to the new western territories after the Mexican War. One author has described the overland mail routes as substitutes for a transcontinental railroad, the building of which was being considered by Congress as early as 1853. The selection of a route for the railroad was blocked by sectional quarrels, and meanwhile Congress au-

[72] The development of patronage practices in the Post Office is given in Dorothy G. Fowler, *The Cabinet Politicians: The Postmasters General, 1829-1909.*

[73] In 1846, following the important revision of letter postage, the deficit jumped up to about 15 percent of expenditures, but was reduced in 1847. From 1848 through 1851 the Post Office recorded a small profit in each year. (*ARPG*, 1951, p. 209.)

thorized an expensive mail service to the West.[74]

In 1848 the Post Office began to deliver mail to California and Oregon.[75] Pacific Coast mail was at first carried by ship to Panama, then across the Isthmus (by canoes and mules up to 1854, when a railroad was built), and then by ship the rest of the way.[76] Routes connecting certain places in the Far West were also developed. In 1852 the Postmaster General mentioned a contractor who had undertaken not only to carry mail from Salt Lake City, Utah, to Sacramento, California, but also to build a fortified post "which will increase the security of the mails and afford protection to the numerous emigrant trains on their journey to California."[77]

In 1858 the first overland mail route to the Far West was put into operation—from St. Louis, Missouri, via El Paso, Texas, to San Francisco.[78] Other overland routes to California and Oregon were opened up in succeeding years. In 1862 the Postmaster General reported that one of these routes had been unsatisfactory due to "Indian depredations" and bad weather, and that a new and more direct route had been substituted, for which he hoped greater success: "Every day brings intelligence of the discovery of new mines of gold and silver in the region traversed by this mail route, which gives assurance that it will not be many years before it will be protected and supported throughout the greater part of the route by a civilized population. As an agency in developing these resources for the government the mail line is indispensable."[79]

The Post Office's activities as nation-builder touched off a discussion of the Department's "true" functions. In 1858 the Postmaster General wrote: "It is evident . . . . that the whole theory on which the Post Office Department was founded has been in a great measure departed from." He pointed out that the Panama and overland mail routes did not yield returns at all proportionate to their cost but that the country was more than remunerated through development of its resources and the establishment of connection with its Pacific possessions. The Postmaster General suggested that the Post Office had two functions: transmission of mail and development of the nation. Its own revenues should pay for the former, the general revenues of the Treasury should pay for the latter. "It is in the light of this distinction that the operations of this department ought to be examined. It is no longer a machine composed of horses, stages, and mail bags . . . . It has become the great pioneer of civilization and progress."[80]

In 1859 a new Postmaster General opposed this view of the Post Office's recent activities, severely criticized the heavy expenditures on unpopulated mail routes, and asserted that the western development was being made at the expense of the mail service for the older, more settled portions of the country, which were insisting on more service. He advised this section of the public to "appeal to their representatives to restore to this department its revenues which are now being squandered in the wilderness." A comparison of the receipts and expenses of the six mail routes to the Far West showed that their main purpose was not postal communication but the "advancement of ulterior objects. Indeed, it has not been concealed, but openly

[74] Frederic L. Paxson, *History of the American Frontier* (Boston: Houghton Mifflin, 1924), pp. 460, 466-467.
[75] *ARPG*, 1848, p. 1241; *ARPG*, 1849, pp. 782, 796.
[76] *ARPG*, 1856, pp. 4-5; Paxson, *op. cit.*, p. 374.
[77] *ARPG*, 1852, p. 643.
[78] *ARPG*, 1858, pp. 718, 740.
[79] *ARPG*, 1862, pp. 120-121.
[80] *ARPG*, 1858, pp. 724-726.

avowed . . . . that they were intended . . . . as an instrumentality for promoting the settlement of our frontiers, and thus appreciating the value of the national domain." The Postmaster General did not quarrel with this general policy but felt that it was a breach of the government's obligations to use the Post Office for these purposes.[81]

By the end of another two decades the natural growth of the country had abated the expensiveness of the Post Office's western service,[82] but the philosophy of postal finance embodied in the overland mail routes would be given expression again in very large expenditures on rural delivery in the 1900's, and on airmail subsidies in recent times.

Policy toward Postal Deficit. The Congressional attitude toward postal costs evidently changed radically between 1845 and 1851. When Congress lowered letter postage in 1845, it required the Postmaster General to reduce costs by hiring cheaper transportation for the Department.[83] In 1851, however, the law that lowered rates specifically provided that service was not to be cut, even if revenues declined as a result of the rate reductions. A law of 1825 had ordered that the Postmaster General was to discontinue post roads which after three successive years failed to yield in revenues one-fourth the cost of operating them. The discontinuance of routes because they did not yield one-fourth the cost of operation gradually ceased.[84] Thus the habit of applying some fairly definite economic limit to the extension of service was evidently abandoned.

On the other hand, the postal deficit was not always frankly accepted. This period marks the beginning of several attempts in Post Office history to diminish the deficit by various devices other than by cutting costs or raising prices. Between 1859 and 1867, some Postmasters General occasionally adopted the method of reporting a $700,000 annual appropriation of the Treasury as part of postal revenues, without identifying the sum as a special appropriation, In the *Annual Reports* of 1867 and 1868 this practice was carried further, by the arbitrary addition of special appropriations and subtractions of "special expenditures" in even larger amounts than $700,000.[85]

In the modern era, the reduction of the deficit by passing legislation which would call Post Office outlays, or parts of them, by some other name, has often been suggested. This would be accomplished by drawing a distinction between the "service motive" and the "profit motive" in postal policy. The first attempt of this kind was made in the late 1920's, and was probably the result of Congressional embarrassment over the failure to use the new Cost Ascertainment system as a guide to postal ratemaking.

The three sets of rate hearings from 1925 through 1928, right after the inauguration of Cost Ascertainment, were mainly taken up with Post Office users' severe criticism of Cost Ascertainment. The most exhaustive hearings, those of the Joint Subcommittee, produced no legislation. The Subcommittee completely failed to recommend a permanent schedule of postage rates, as it had been instructed to do, nor did its report discuss the connection between the cost allocation and postal rates.[86] The 1928 law lowered postage for all of the three classes of mail on which the cost allocation showed a deficit. When a Post Office official was asked how the re-

[81] *ARPG*, 1859, p. 1427.
[82] *ARPG*, 1881, pp. 28-31.
[83] *ARPG*, 1845, p. 852.
[84] *ARPG*, 1851, p. 424; *ARPG*, 1881, pp. 24, 26.
[85] *ARPG*, 1860, 1862, 1867, 1868.
[86] 69th Cong.: 1st Sess., *Senate Document 109*, 1926, pp. 1-6

ductions could possibly be justified, in view of Cost Ascertainment results, a member of the House Post Office Committee interposed: "I think I can answer for the Department . . . . The Department has been so annoyed by continued knocking at the door . . . . for reduced rates that the head of the Department . . . . has yielded for the sake of peace."[87] The history of cost allocation results by five-year intervals is given in Table VII.

In the 1928 legislation which lowered rates on second, third and fourth class mail, Congress provided that the Post Office could "take credit" in the financial statements of the Department for the estimated costs of free Congressional and government agency mail, free-in-county and free-to-the-blind mail, and the amount of loss due to the preferential second class rate for non-profit publications. (These provisions were very simi-

TABLE VII—PROFIT AND LOSS, AND RATIO OF REVENUE TO COST, FOUR CHIEF CLASSES OF MAIL

A. *Profit and Loss (millions of dollars), and Percentage of Revenue*

Fiscal Year	First Class[1]		Publishers' Second Class		Third Class		Parcel Post	
	Profit	% of Revenue	Loss	% of Revenue	Loss	% of Revenue	Profit-Loss	% of Revenue
1926	$ 73.8	23	$ 83.5	241	$ 1.8	3	$ 3.0	3
1931	58.3	17	96.9	373	23.4	39	20.1	14
1936	108.9	31	91.1	442	23.0	36	18.0	15
1941	153.8	36	83.8	346	22.3	28	11.6	9
1946	143.1	24	148.0	480	52.2	62	31.0	16
1951	102.3	13	201.0	411	130.1	82	122.6	31
1955	62.3	6	234.6	398	172.0	64	+13.6	2
	B. *Ratio of Revenue per Piece to Cost Per piece*							
1926	1.30		.29		.98		.97	
1931	1.21		.21		.71		.87	
1936	1.43		.18		.73		.87	
1941	1.55		.22		.79		.92	
1946	1.31		.17		.61		.86	
1951	1.15		.18		.55		.77	
1955	1.07		.21		.61		1.02	

[1] Includes post cards and parcels mailed first class.

Source: Cost Ascertainment Report, given fiscal years, Tables 41 and 100.

lar to proposed legislation agreed on by the National Council of Business Mail Users in 1925. See section on third class mail.) A member of the House Post Office Committee objected that heretofore the Post Office had frankly called the attention of the public to its income and its outgo. It ought not now "lend itself to this kind of a camouflage." He foresaw that if the Post Office started "this kind of accounting" there would be no end to it. The Post Office agreed that such dangers existed, and for that reason it would "take credit" only for services that were carried absolutely free, and not for any that were required to pay postage.[88] From 1929 through 1941 at least, in accordance with this legislation, the *Annual Reports* of the Postmaster General made a distinction between the total deficit of the Department and what might be called the "true" deficit, although all costs were completely set forth. In recent years this distinction

[87] *1928 Rate Hearings*, pp. 4, 22-24.

[88] *Ibid.*, p. 69.

has not been made, only the total deficit being shown.

The idea has been revived recently in connection with the very large annual deficits (see Table VIII) of the postwar period—the result of Congress's continuing failure to raise rates at all commensurately with rising costs of the postal service. In 1953, the Senate Post Office Committee appointed an Advisory Council to make a thorough study of postal rates. The membership of the Council included the chairman of the board of the Curtis Publishing Company (*Saturday Evening Post* and *Ladies' Home Journal*), a vice president of Spiegel, Inc. (a mail-order firm), a director of the National Editorial Association, and other publishers and representatives of the Associated Third Class Mail Users and

TABLE VIII—THE POSTAL DEFICIT*

Fiscal Years	Number of Years	Revenues	Expenditures	Profit (+) or Deficit	Profit or Deficit as Percent of Expenditures
		($1,000)	($1,000)	($1,000)	
1789-1820	32	15,137	13,425	+ 1,712	12.8
1821-1850	30	91,375	92,309	934	1.0
1851-1880	30	472,921	589,905	117,984	20.0
1881-1910	30	2,923,770	3,133,699	209,929	6.7
1911-1920	10	3,230,575	3,098,028	+ 132,547	4.3
1921-1930	10	6,092,720	6,656,140	563,420	8.5
1931-1935	5	3,049,795	3,623,292	573,497	15.8
1936-1940	5	3,633,082	3,890,846	257,764	6.6
1941-1945	5	5,065,990	4,877,327	+ 188,663	3.9
1946-1950	5	7,184,023	8,918,418	1,734,395	19.4
1951-1955	5	10,433,840	13,129,976	2,696,136	20.5

*Based on Table XIII in U. S. Post Office Department, *Financial Policy for the Post Office Department* (Washington: Government Printing Office, 1954), p. 87.

the National Council on Business Mail.[89] The Senate Post Office Committee particularly asked the Council to investigate whether certain items—free postal services, services performed by the Post Office for other government agencies, and services which "may be justified only on a national welfare basis and not primarily as a business function"—should be subtracted from the costs of the various classes of mail. The Advisory Council subsequently recommended that these services should not be covered by Post Office revenues but by general funds of the Treasury. Services of the "national welfare" type were identified as (portions of) the expenditures on country post offices and on rural delivery.[90]

Conclusion

The postal rates fixed by Congress over the past one hundred years have been determined largely by various social and political factors, while such economic calculations as recovery of costs have played a minor role. The postal rates charged for at least three of the chief classes of mail appear to have been determined to a great extent by Congressional responses to pressure groups of the users of these mail services. The most outstanding case is that of the newspaper and magazine publishers,

[89] U. S. Post Office Department, *Financial Policy for the Post Office Department* (Washington: Government Printing Office, 1954), p. 129.

[90] 83rd Cong.: 2nd Sess., Senate Committee on Post Office and Civil Service, *Senate Report 1086, Postal Rates and Postal Policy of the Post Office Department*, 1954, pp. ix, 5, 18, 33.

whose representatives have successfully lobbied for very favorable treatment since at least the 1870's. The extremely low rates given to newspapers and magazines, the huge second class mail deficit, and the speeches of Congressmen and Senators in Congressional debates testify that the pricing of this particular mail service is a tribute to an extraordinarily powerful pressure group. Other groups whose influence on postal rates has been considerable are direct-mail advertisers, book publishers, and farmers' organizations. An important determinant of the postage on letter mail has been the Post Office's legal monopoly. The monopoly has probably often shielded inefficiency of postal operations, as evidenced by recurring instances of illegal private competition, particularly during the nineteenth century, and by the deliberate use of the letter monopoly in 1932 as a means of decreasing the postal deficit.

On the expenditures side, the use of certain cost criteria for the expansion of service was apparently abandoned for the first time in the mid-nineteenth century in favor of other objectives, among them the use of the Post Office as an instrument of western settlement. Decades of controversy over second class mail led finally to the establishment in the 1920's of an elaborate system of allocating postal costs to the various mail classes, but it has been virtually ignored as a basis for rate-making. The long-standing, characteristic Congressional treatment of postal rates and postal expenditures outlined in these pages has resulted in the chronic postal deficit, one which in modern times became enormous during the early years of the depression and again in the period since the second World War.

Apparently uncomfortable, either with the size of the total deficit, or with the large deficits shown by the cost study for some of the classes of mail, Congress has at times in the last twenty-five years considered various devices for "reducing" the deficit by labeling parts of the postal operation as "national welfare" expenditures. Throughout much of Post Office history, Congress has evidently preferred to avoid dealing directly with the problems of the postal deficit and of decisions on basic postal pricing policy.

Capital Costs of Private vs. Public Power For AEC—A Review

By JOSEPH LERNER*

THE article, "Capital Costs of Private vs. Public Power for AEC,"[1] is an analysis of certain costs (financing, depreciation, and state and local taxes) when the AEC is to choose between obtaining electricity from a plant to be constructed by the federal government or from a private plant on a long-term contract in which the power rate is to cover certain designated costs. The contract characteristics for the purchase of private power are designed to be representative of those made by AEC.

Before turning to the discussion, I should emphasize that I am not attempting to answer the question of whether a federal or a private plant is more appropriate as a source of electricity under the conditions outlined in the Krutilla-Peterson paper. Furthermore, it must be stressed that in both the original presentation and here the plants are assumed to be the same in actual capital cost and efficiency. Therefore, with but one exception the differences in government expenditures under the two operations involve income transfer or equity considerations rather than resource allocation or efficiency. The one possible source of efficiency difference is that the actual, direct costs of raising funds may differ in the two cases.

The Krutilla-Peterson analysis makes two comparisons of the private and federal costs for periods of two lengths, 25 years and 35 years. These two periods were selected because the assumed private contract would be for 25 years with an option available to the government for a 10-year extension. In either case the plant was assumed to have an engineering "life" of 35 years.

The original paper assumes that private power rates charged the AEC during the 25-year period would allow a return of 8 percent after taxes on the equity capital of $5 million of the $100 million of total initial capital. The $5 million is also equal to the portion of the total capital costs which is not regarded as depreciable, consisting of land and "permanent" improvements. The entire original bonded indebtedness of $95 million coincides with the depreciable investment which is entirely written off during the 25-year period by the level-premium form of amortization.[2] The interest rate is 3.5 percent for the private bonds. The private power rate also covers state and local taxes. Finally, the rate includes operating costs. However, the operating costs portion of the rate does not enter the computation since they are taken to be the same for either the federal or the private plant.

In the Krutilla-Peterson paper the relevant federal plant costs for the 25-year period consist of interest and depreciation. They use an interest rate of 2.5 percent for the federal government. The $95 million of depreciable investment is written off by way of level premium amortization over a 35-year

* Resources for the Future, Inc., Washington, D. C. No organizational views are reflected here. The author's discussion of the article has benefited from numerous conversations with John V. Krutilla who is also a staff member of this organization.

[1] John V. Krutilla and John M. Peterson, *Land Economics*, February 1956, pp. 14-24. The article discusses a federal plant Tennessee Valley Authority (TVA) as the alternative to a private plant. It does not take up municipal or cooperative operations. Atomic Energy Commission is referred to hereinafter as AEC.

[2] Throughout this paper the term "amortization" is used to mean "level-premium amortization." Therefore the sum of the interest payment and the bond retirement is the same in each period.

period. The capital writeoff realized during the first 25 years comes to $59,077,000 by this method. Interest is paid at the 2.5 percent rate on the remaining $5 million of investment which is regarded as not being subject to depreciation. State and local taxes are not paid by the federal plant.

For the 25-year period the total for the costs to be compared comes to $200,330,000 for the private plant as opposed to $105,738,000 for the federal plant. Of this $94,592,000 advantage for the federal operation, $35,923,000 is due to the more rapid writeoff of the private plant; $35,625,000 is due to state and local taxes which are not paid by the federal plant; and $23,044,000 is due to the larger interest and divided payment. As will be explained later, it appears that, had time permitted, Krutilla-Peterson would have placed state local taxes at $15,200,000 instead of $35,625,000 for the 25 years. This would make the difference in favor of the federal plant $74,167,000 instead of $94,592,000.

In the Krutilla-Peterson analysis federal tax collections on the various expenditures are $14,475,000 for the private plant and $11,665,000 on the federal plant, reducing the advantage of the federal plant from $94,592,000 to $91,782,000. However, they conclude that federal tax collection furthers the advantage of the federal plant because it increases the ratio of private costs to federal costs. I hold that changes in the absolute difference in costs determine the impact of tax collection on the advantage of the federal plant.

Continuing with the Krutilla-Peterson analysis for the 35-year period: if the AEC exercises its option to extend the contract an additional 10 years, the rate charged by the private plant would cover a return of 8 percent after taxes on the equity capital and state and local taxes. The federal plant would have to write off $35,923,000 of depreciable investment in addition to interest payments during this period. These costs would be met by a continuation of the amortization of the depreciable investment in the federal plant. In addition, there would be interest payments on the $5 million of nondepreciable investment. Krutilla-Peterson find that for the 35-year period the advantage of the federal plant is approximately $75 million. This consists of approximately $25 million of interest and dividend payments and about $50 million of state and local taxes.

When federal tax collection is taken into account in their calculation for the 35-year period the advantage of the federal plant is reduced to approximately $69 million, consisting of about $19 million in interest and dividends and some $50 million in state and local taxes.

Aside from the various dollar computations which are carried through in the Krutilla-Peterson paper there was an important set of considerations set forth for comparing the federal and the private plant approaches. While these were not quantified, they are important. Among the matters considered in this fashion were the possibilities of gains and losses for both the federal government and the private utility group in the event of contract cancellation before the 25-year period is completed. In the same vein, consideration is given to the possible effects of the AEC's decision with respect to the 10-year option period beyond the 25th year. With respect to both cancellation and the option to take power for the additional 10-year period, Krutilla-Peterson find that the private contract does not compare favorably with a federal plant. In either circumstance the private contract is seen as placing the federal government in the position of

assuming most of the risk without any possibility of gain.

To supplement the Krutilla-Peterson results for the 25-year and 35-year periods, I carry through a number of parallel computations using different depreciation methods. The general effect of these recomputations is to reduce the advantage of the federal plant for the 25-year period and increase its advantage for the 35-year period. For example, when a 35-year straight line depreciation is taken on both the federal and private plants the advantage of the federal plant is reduced by $35,827,000 for the 25-year period as compared with the original Krutilla-Peterson finding. All of the $35,923,000 advantage due to the difference in capital writeoff periods is eliminated and there is a $96,000 increase in federal plant advantage due to interest and dividend payments.

It is particularly noteworthy that in my calculations the interest and dividend advantage of the federal plant is increased after federal tax collection for both periods even though my method of computing federal taxes increases the amount collected on the private plant outlays and drastically reduces revenue realization on the federal plant.

Some of the results of my various recalculations may be summed up as follows: except for state and local taxes, it appears that the expenditure advantage for the federal plant is larger than is indicated by the Krutilla-Peterson analysis. Their presentation understates the tax collection advantage of the private plant; on the other hand, their depreciation method leads to an even larger understatement of the interest and dividend advantage of the federal plant.

As to inclusion of state and local tax payments as part of the cost difference, I consider the case made by Krutilla-Peterson for taking them into account. However, I do not attempt to resolve the problem as to how state and local taxes should be handled. My impression is that an adequate answer would be complex and would require separate attention.

My examination of the Krutilla-Peterson paper is carried out at several levels, among them the recomputation of results with most assumptions unchanged, the evaluation of assumptions, and the interpretation of numerical findings. At the outset it is useful to list and describe some of the points which will be demonstrated or are put forth for consideration. Of the 10 points listed, four (numbers 3, 5, 7 and 8) are discussed separately and in greater detail.

1. As the Krutilla-Peterson paper designs the numerical characteristics of the federal and private plants, it is impossible for the private plant to show lower costs than the federal plant even if private capital were offered free of interest and dividend charges for the first 25 years—the period for which they make the most detailed computations.

In the Krutilla-Peterson presentation, total federal "capital costs" (bond interest and capital recovery) for the 25-year period come to $105,738,000. For the utility operation their computation of capital recovery and state and local taxes (even at the reduced rate explained immediately below) alone comes to $110,200,000. Therefore, even interest and dividend-free private capital could not compete in the 25-year period because the state and local taxes and capital repayment would be $4,462,000 larger than the interest costs and capital repayment in the federal plant.

2. One of the changes which I make is taken from a footnote in the Krutilla-Peterson paper. According to their footnote, state and local taxes average 0.64 percent instead of the 1.50 percent

of original fixed investment which they used in their calculations.[3] The annual reduction is .86 percent of $95,000,000. Except for the publication schedule they would have made the same adjustment.

This annual change in state and local taxes amounts to $20,425,000 for 25 years and $28,595,000 for 35 years and the federal plant advantages for these periods are reduced by these amounts even before changes are made in federal tax collection. Since this is an adjustment derived from their own material, I will generally incorporate this change in their results rather than refer to it as a change which I am making. There will be some exceptions which will be identified.

3. Even when accepting the Krutilla-Peterson method of calculating depreciation (amortization method with 35 years for the federal plant and 25 years for the private plant) and the inclusion of state and local taxes (at the reduced rate) as a source of cost difference the following changes in results have been found upon recomputation of federal tax collection on bond interest in the case of the federal plant and on corporate income, dividends, and bond interest in the case of the private plant. (a) The 25-year period cost advantage difference of the federal plant is $61,536,100 instead of $71,357,000. (b) Under the same terms the 35-year period (in the event the 10-year option is taken up) cost difference is $30,345,535 instead of $40,166,781.

4. A very important source of the Krutilla-Peterson cost difference is the payment of state and local taxes by the private plant while the federal plant does not make such payments. Even the most general Krutilla-Peterson justification for including this source of cost difference does not enjoy general acceptance. Their position is that state and local taxes should not be paid by the federal plant because only areas near the steam plant would benefit from these taxes which would be met from national revenues as a part of the cost of national defense. This theoretical position is diametrically opposite to one of the principles set forth by the Study Committee on Payments in Lieu of Taxes and Shared Revenues which stated: "The costs of local government allowable under the property tax system to an item of federally-owned property should be borne by the federal taxpayer if the property serves primarily a national . . . . purpose."[4]

Furthermore, Krutilla and Peterson take the position that the federal plant is to be preferred to the private plant because the federal plant does not pay state and local taxes or payments in lieu of them. They regard it as "inconsistent" for the AEC to pay state and local taxes through the power rate it would pay the private plant while not making such tax payments on the much larger investment in the plants in which the power is used. This contention is anything but convincing. Most federal facilities including the AEC purchase from private companies and by so doing in effect pay state and local property taxes.[5] Furthermore, it has been argued[6] that the AEC should

[3] *Op. cit.*, footnote 8, p. 18.

[4] *Payments of Taxes, or in Lieu of Taxes to State or Local Taxing Units, Hearings before the Committee on Government Operations*, U. S. Senate, 84th Congress, 1st session, Part I, July 25, 1955, p. 151. (Abstracted from p. 3 of "Payments in Lieu of Taxes and Shared Revenues," in the *Study Committee Report* submitted to the Committee on Intergovernmental Relations, June 1955.)

[5] Actually the AEC may make payments in lieu of state and local taxes with respect to its properties. On the other hand, Tennessee Valley Authority does not make payments in lieu of taxes on power sales for federal government use. Consequently, this might mean that some payments would be by the AEC if the AEC were to generate its own power but that such payments would not be made if it purchased from the Tennessee Valley Authority. I have substituted "TVA" for "federal" plant for the reason that the TVA is in a special position with regard to payments in lieu of taxes. There is a federal payment of 5 percent of gross revenue, excluding sales to federal agencies for governmental use.

[6] *Hearings before the Committee on Government Operations*, U. S. Senate, *loc. cit.*, part 2, p. 253.

not make payments in lieu of taxes because it is a special "case": (1) AEC pays operating expenses of three principal AEC towns; (2) where special problems have arisen with respect to schools or housing the AEC has called on other federal agencies to cope with the needs; (3) the special nature of the capital improvements. These are not characteristics of power plants or of the terms of the Krutilla-Peterson federal operation.

5. Krutilla and Peterson conclude that federal tax collection increases the financial attractiveness of the federal plant. (In this instance the state and local tax rates are not reduced. My point concerns the proper criterion rather than numerical values per se.) Before federal tax collection, their calculation finds private operations costing 1.895 times as as much as the government operation for the 25-year period. After federal tax collection their results show the private operation at 1.976 times the federal cost. The change in the ratios of the two costs is the basis of their conclusion that federal tax collection increases the attractiveness of the federal plant. However, the proper measure is the absolute cost difference. And this decreases by $2,810,000 when federal tax collection is taken into account in their presentation. Therefore, federal tax collection reduces the advantage of the federal plant even according to their original computations.

6. The federal plant is written off in 35 years while the private plant is written off in 25 years. Consequently, the capital writeoff for the two operations is far from comparable for the first 25 years. In this instance it overstates the cost advantage of the federal plant for the first 25 years.

The two writeoff periods, 25 years for the private plant and 35 years for the federal plant would be valid in only one set of circumstances. The division into two periods as made in the Krutilla-Peterson paper can be meaningful only if the federal plant were operated for the 35-year period while the private plant contract could be terminated at the end of 25 years. It is not enough that the federal plant have the 35-year operating period; it is also necessary that the last ten years of operation yield a return sufficient to cover remaining capital cost to be written off and that the system interrelationships of the particular plant be taken into account. Otherwise, some of the "return" to the specific plant could be at the expense of other plants in the federal electric power system.

If power were taken by the federal government for the 35-year period irrespective of whether there is a federal plant or a private plant, the 25-year computation would turn out to be irrelevant. If power were taken by the federal government or were marketable for the 25-year period only, irrespective of whether there is a federal plant or a private plant, the 35-year calculations become irrelevant and the 25-year figures require recalculation because the federal plant would incur an obsolescence loss at the end of the 25th year equal to the $35,923,000 advantage of the federal plant with respect to capital writeoff.

It is to be noted that what I refer to here is only the validity of using the two time periods for capital writeoff. Even if the time period division were appropriate the use of amortization in place of depreciation within that period would not be correct and would bias the results because it makes the average period of the capital too long. In other words it depreciates the investment too slowly, thereby increasing the advantage of the operation with the lower interest rate.

7. Their amortization approach to capital writeoff in which the sum of

interest payment plus the capital writeoff is an equal amount in each year of the life of the property does not correctly reflect depreciation. The fixed annual sum starts with very little capital writeoff in the first year and becomes almost entirely capital writeoff in the last. This substitute for depreciation is particularly unsuited for making capital writeoff comparisons at intermediate periods within the life of the property. For example, when 35-year double declining balance depreciation (as provided in the Internal Revenue Code of 1954) is substituted for amortization in the federal plant and the 25-year-amortization of the private plant is unchanged, the federal advantage with respect to capital writeoff is reduced from $35,923,000 to $18,584,000 for the 25 years.

8. While the periods and form of depreciation used in the Krutilla-Peterson paper lead to an overstatement of the capital writeoff advantage of the federal plant for the first 25 years, they concurrently lead to an understatement of the federal plant advantage in interest payments for both the 25-year and the 35-year period. When I substitute "more appropriate" depreciation methods the increased advantage to the federal plant for the 35-year period because of the interest rate advantage of the federal government is larger than the federal tax adjustments which I make in the Krutilla-Peterson paper. Specifically, when I apply double declining balance depreciation to the federal plant for the 35-year period and 25-year amortization to the private plant (as they did), I find that the advantage of the federal plant for the 35-year period (after federal tax collection) is $3,916,344 *higher* than their results in which they did not correctly compute federal tax collection.

In my point 3b it was noted that proper federal tax collection calculations within the Krutilla-Peterson depreciation approach would reduce the federal 35-year advantage after federal tax collection from $40,166,781 to $30,345,535. However, here it is seen that if double declining balance depreciation is substituted for amortization in the federal plant the advantage of the federal plant is increased to $44,038,125 even when applying my federal tax collection method. This change follows from the very large increase in the federal interest payment advantages consequent to the change in depreciation method for the federal plant. When 35-year straight-line depreciation is applied to both plants, the federal plant advantage for the 35-year period is even larger, reaching $46,747,-106 after federal tax collection.

While bringing the capital writeoff methods to a more comparable basis increases the federal plant advantage for the 35-year period, it reduces its advantage for the 25-year period. For example, straight line depreciation on both plants reduces the 25-year period federal plant advantage from $61,536,000 (Krutilla-Peterson depreciation with revised federal tax collection approach) to $35,530,000. This decrease in the federal advantage results from a loss of nearly $36 million of capital writeoff advantage and an increase of nearly $10 million in the interest advantage; leaving a net decrease of approximately $25 million in the federal plant advantage for the 25-year period.

The shorter depreciation period for the private plant in the Krutilla-Peterson examination in a sense makes it somewhat of a "public" plant. When the "depreciation" component of the power rate charged AEC exceeds actual depreciation, federal capital is substituted for private capital. At one extreme, for

example, the federal government could pay back the entire cost of depreciable assets upon the completion of the installations. This would nearly entirely "eliminate" interest payments on the private plant, leaving only dividend payments on 5 percent of the total investment. Under such circumstances an analysis in the form made in the Krutilla-Peterson paper[7] would show the "private" plant with lower costs than the federal plant. But, of course, in such a situation it would be realized from the outset that federal bonds were substituted for utility bonds and interest on such federal bonds would be computed and taken into account. By analogy, I suggest that, to the extent that the capital writeoff part of the power rate exceeds appropriate depreciation, the plant is federally financed and the federal interest payment on such financing should be taken into account. I have not made this computation. However, it must be kept in mind that even the Krutilla-Peterson private plant does have this important element of federal financing.

9. The Krutilla-Peterson conjectures as to what is likely to happen at the end of the 25-year period when it is necessary for the federal government to decide whether to take up the option for an additional 10 years do not cover the range of possibilities. On the one hand, it is assumed that if AEC did not require the power for the last 10 years the federal plant would generate and market power. At the same time, it is assumed that the option to take power from the utility group would not be exercised under these conditions even though it would be to the advantage of the federal government to take the option and in turn market the power. Indeed this possibility is not even considered.

10. The Krutilla-Peterson comparative summarization of the consequences in the event the government cancels the contract before the 25th year is not correct. In that event the cancellation payment to be made by the federal government would be in accordance with a schedule incorporated in the original contract. This schedule is based on assumed growth levels of the non-AEC electric market. If the relevant electric power market is more satisfactory than that postulated in the contract, the utility company would benefit from the cancellation. On the other hand, should the market be inferior to that projected in the cancellation provision, the utility company would suffer a loss upon cancellation. Krutilla-Peterson say this means that in the private utility case the government can only lose since regardless of the market for power in any event a cancellation payment must be made. On the other hand, they contend that in the federal plant the government's potential loss in the event of a deterioration of the power market is balanced against the possibility of gain should the market prove superior. They do not take into account the possibility that the government's loss on the cancellation of the private contract may be lower than the loss in the government operation under such circumstances and therefore the cancellation payment may be a source of net advantage.

Finally, it must be kept in mind that it is the government which would have the option. There is no compulsion upon the government to cancel. Since the government already has a number of such options with respect to other power for AEC, there could well be cost minimization by selection among the contracts to be cancelled.

Now I will deal with some of my observations in additional detail. I

[7] This does not mean that they would make this type of analysis under such circumstances.

begin with the 3rd point—federal tax collection. For the 25-year period I find the Krutilla-Peterson paper off by $9,821,000 in the computation of net federal tax collection. The difference consists of two parts, a $736,575 understatement of taxes collected from public utility bond holders and a $9,084,425 overstatement in net taxes collected on interest paid for the federal plant.

There is another federal revenue adjustment which might materialize but which I do not calculate. This is the impact of state and local taxes on federal tax payments. For example, if the level of state and local activities is unchanged even though the federal government plant does not make payments in lieu of taxes, federal tax collection would be reduced by increased state and local taxes to the extent they are taken as costs or itemized deductions in federal tax computation.

Even though it is the lesser source of the tax collection change, I will discuss the $736,575 understatement in federal tax collection on bond interest payment from the private plant first. One essential feature of the Krutilla-Peterson model is the assumption that the private power company bonds could be held by insurance companies. I accept this assumption.

Under the present law, 6.5 percent is the statutory tax rate on insurance company investment income.[8] Since there are expenses involved in handling the bond interest receipts of an insurance company, the full 6.5 percent tax rate would not apply to the bond interest.[9] The Krutilla-Peterson paper allows for them by reducing the tax rate from 6.5 to 5 percent which is equivalent to assuming that the expenses involved come to 23 percent of interest received. I believe it to be an extremely high cost of doing business of this kind. I would suggest that "collection" costs are more on the order of 1 percent of such bond interest receipts, thereby making the tax collection equal 6.435 percent of the bond interest (99 percent of 6.5 percent). Furthermore, a large share of the expenses involved in the bond interest collection is in the form of wages and salaries on which the tax rate is many times the 6.5 insurance company investment rate. To simplify the presentation I will use the 6.5 percent tax rate on the bond interest. With total bond interest payment to the insurance company coming to $49,105,000 for the 25-year period and a 1.5 percent increase in the tax rate above the 5 percent used by Krutilla-Peterson, I increase federal tax collection on the bond interest by $736,575.

It is suitable at this point to discuss the reduction of $9,084,425 in net tax collection on the federal bond interest payment for the federal plant option as compared with the private utility option. This substantial change results from adding another vital step to the analysis, namely, taking account of the insurance company investment decision if the public utility bonds are not available to them because of the construction of the federal plant instead of the private plant. The Krutilla-Peterson computations do not include this question. Essentially their failure to do so corresponds to the assumption that the insurance company does not substitute earning assets for the public utility bonds, that the funds which would have been devoted to the purchase of the public utility bonds are not invested in earning assets.

[8] The key reason for this special rate is that a substantial proportion of the insurance company investment realization does not belong to it but becomes an obligation to policy holders. The appropriateness of the present method of taxing insurance companies, is of course, beyond the range of this commentary.

[9] In addition to the expense ratio, a slight element of rate gradation may contribute to the difference between the maximum rate applicable to this income and the rate used. This factor, however, is unlikely to be important because this is a marginal calculation and the potential insurance company bondholders probably are all at income levels at which incremental income is subject to the maximum rate.

While the course of insurance company action cannot be anticipated with precision, I use the assumption that the insurance companies would substitute other investments which yield the same income as would have been realized if the utility bonds had been taken. The computation is further simplified by the assumption that the costs associated with the alternative income are at the same level. Therefore, the investment substituted for the utility bonds would yield the same amount of federal taxes.

The pivotal point is that the investments substituted for the utility bonds would have been held by others. What would have been their tax rate? Here it is assumed that the tax rate for the alternative holders of assets which substitute for the utility bonds is the same as the relevant rate for the holders of the national debt, in this case taken to be 25 percent.[10] Consequently, $49,105,000 of taxable income would be "transferred" from taxpayers with a tax rate of 25 percent to the insurance companies with a tax rate of 6.5 percent[11] as a result of the decision to build a federal plant. The federal tax loss is the 18.5 percent (25 percent minus 6.5 percent) of $49,105,000 (the net income transferred) which comes to $9,084,425—which is the larger tax adjustment. Offsetting this are taxes of $8,754,000 realized on the interest payments to holders of federal debt for the federal plant at the 25 percent tax rate. The result is a net federal revenue loss of $330,425 instead of the Krutilla-Peterson computed $8,754,000 revenue collection ascribed to the interest payments on the federal plant. This is equivalent to using the insurance company tax rate for the federal bond interest tax rate because of the investment substitution made by the insurance company.

The fifth point which I list involves the criterion used by Krutilla-Peterson for ascertaining whether federal tax receipts increase the advantage in favor of the federal plant or private utility operation. They answer the question as to the effect of federal tax collection by observing whether the ratio of costs for the two plants rises or falls when federal taxes are taken into account. Because in this context I am concerned with the interpretation of results rather than the results themselves, I use the original Krutilla-Peterson results, including the higher rate of state and local taxes. In the original Krutilla-Peterson analysis (with the higher state and local tax rate), the ratio of the cost of the private utility plant to the federal plant is 1.895 before taking account of federal tax collection, $200,300,000 for the private plant divided by $105,738,000 for the federal plant. Federal tax collection raises this ratio to 1.976 which follows from $185,855,000 for the private plant divided by $94,073,000 for the federal plant.[12] They conclude that: "in short, when account is taken of federal taxes . . . . including the tax on interest earnings of Treasury security holders as well as taxes on the private combine and its security holders, the resulting comparison is more favorable to the federal power agency than when federal taxes were not taken into account."[13]

However, the correct test is whether the *absolute* cost difference increases or decreases as a result of federal tax col-

[10] Even though there may be important doubts as to the correctness and relevance of the average tax rate realization on federal interest payment, I use the Krutilla-Peterson 25 percent rate for both the federal bond interest and for investments which the insurance companies substitute if the private plant were not constructed.

[11] The present discussion does not take account of capital gains or losses and their tax consequences, these being considered as not very significant.

[12] In the Krutilla-Peterson analysis federal taxes collected some 7.2 percent of the private utility costs ($14,475,000), and 11 percent of the federal power buying costs ($11,665,000).

[13] *Op. cit.*, p. 21.

lection. Even though the recapture through taxes is a larger proportion for the government operation than for the private operation (resulting in an increase in the relative cost of the private operation from 1.895 to 1.976 times federal cost) it does not follow that the tax collection further improves the case for the federal operation. For this purpose the absolute difference rather than proportion is significant. Federal tax collection reduces the cost disadvantage of the private plant by $2,810,000, from $94,592,000 to $91,782,000 in the original Krutilla-Peterson computation. If the private plant were preferred to the federal even though it involved $94,592,000 million of outlay, a reduction to $91,782,000 in this difference by federal tax collection should not shift this preference, irrespective of the effect on the ratio of the costs.[14]

The Krutilla-Peterson paper does not use the ratio criterion in formulating the question to which a great deal of their paper is addressed, namely, "when tax payments are taken into account, will net capital costs to government be higher or lower under private than under public ownership?"[15] However, as has been seen, the conclusion which they reach is stated in terms which answer a different question, namely whether taking taxes into account makes the *relative* federal plant advantage larger or smaller than when it is not taken into account.[16] In my recalculations (Table I) using the Krutilla-Peterson depreciation assumptions, the advantage of the federal plant is reduced by $12,631,000 when federal tax collection is taken into account for 25 years (col. 2, row 4 minus row 9).

Now I will deal with the 7th point listed—the use of amortization in place of depreciation for the government plant. While the amortization procedure may be a convenient method of payment by the government to the utility group (the annual sum of interest and capital return being equal in each year), it does not properly express depreciation. For the federal plant it results in the depreciation of slightly more than 62 percent of the depreciable property ($59,077,000 capital recovery of a $95,000,000 depreciable investment) when more than 70 percent of the expected life of the property (25 of 35 years) has passed. While economic and business considerations suggest that there should be more capital written off in the earlier years than in the later years, amortization involves the reverse, little capital recovery at the outset, increasing continuously through the final year. This characteristic of amortization is especially unsuitable for the purpose of making capital recovery comparisons when different

[14] The error in using ratios where absolute differences dominate is so important in itself that it is worth a few words. Suppose that two air conditioners are priced at $400 and $200, respectively. The householder in the market for one air conditioner considers that from his view point he is prepared to pay $100 more for the more expensive than for the less expensive one. What would be the customer's decision if the $400 air conditioner is reduced by 60 percent to $160 and the less expensive one is reduced by 65 percent to $70, making for a difference of $90? Consistent with the initial assumption that the "superior" make is worth $100 more to him, the more costly unit would be purchased even though proportionately the more expensive one has the lesser reduction and consequent price ratio increase, from 2 to approximately 2.29.

[15] *Ibid.*, p. 19.

[16] The ratio approach is used or implied at two additional points in the Krutilla-Peterson presentation. In discussing capital costs in the event the contract were extended to 35 years the ratio test is used, this time stated in its percentage form: ". . . . total gross capital costs to the government over the 35-year period would approximate $223 million for the private combine, or about 51 percent greater than the $148 million for the federal agency model. Deducting federal taxes in both cases, however, would leave net costs to the government still 51 percent greater under private utility than under the federal power model." (p. 22). This seems to say that both before and after federal taxes the private plant shows the same disadvantage even though the difference reduced from $75,000,000 to $62,960,000 in the actual computation.

Again, the porportionality argument is used in the conclusion: "1. Adjusting for federal taxes to determine net cost to government for AEC's power does not lessen the costs proportionately more under private ownership than under government ownership." (p. 24).

amortization periods are used for the same investment. It simply does not put the alternatives on a fully comparable basis.

The designation of what would be the most appropriate method of taking depreciation for the federal plant is beyond the scope of my comments. Where the Krutilla-Peterson method writes off $59,077,000 for the federal plant in 25 years, straight line depreciation would write off $67,857,142; and double declining balance depreciation, as permitted under the Internal Revenue Code of 1954, would write off $76,416,000.

Some notion as to the reasonableness of these depreciation rates may be obtained from a consideration of the proportion of total lifetime generation of a plant which is attained in 21 years for a plant with a 30-year life (the same proportionate point in the life of the plant here under discussion). Efficiency improvements in new plants and rising maintenance costs in old plants in conjunction with growing demand make for a distribution of plant lifetime output which moves from nearly full capacity utilization in the early years to very low utilization in the later years. According to the McKinney Report[17] nearly 99 percent of the total lifetime production of a plant is attained when only 70 percent of its chronological life has passed. A 1951 publication[18] giving load duration expectation for a plant with a 40-year life suggests that at the end of 28 years (70 percent of the plant's life) about 90 percent of the electricity to be generated over the plant life will have been attained.

It is essential to keep in mind that depreciation and interest payments move in opposite directions. As depreciation increases, interest payments decrease because depreciation is used to retire bonds. For example, double declining balance depreciation on the federal plant which would increase capital writeoff during the first 25 years by $17,339,000 (from $59,077,000 to $76,416,000) would reduce interest payment on the federal plant by $11,645,000 (from $46,661,000 to $35,016,000). As a result there would be a net cost increase of $5,694,000 for the federal plant for the 25-year period. Furthermore, as will be seen later, the slow writeoff method used in the Krutilla-Peterson paper for the federal plant reduces the 35-year cost difference in favor of the federal plant below what it is with more appropriate depreciation on the federal plant.

Here I am brought to my 8th listed point, that the depreciation method used in the paper seriously understates the the federal plant advantage with regard to interest payments. The Krutilla-Peterson paper mentions something somewhat related: "When the 35-year period is considered, however, a difference in the time distribution of costs incurred and services rendered must be considered . . . . in the case of the private combine . . . . these costs are fully met by the government in some 10 years in advance of services provided. . . ."[19]

I think that they miss the essence of the effect of the timing of depreciation on cost comparisons by considering it as relevant only to the 35-year period. It is is of equal relevance for making cost comparisons for the 25-year period, or any other period. They contrast the writeoff period of the capital with the period for which it is used. Both the amount written off and the time distribution of the writeoff are important.

[17] *Peaceful Uses of Atomic Energy*, vol. 2, January 1956, Report of Panel on the Impact of the Peaceful Uses of Atomic Energy to the Joint Committee on Atomic Energy, 84th Congress, 2nd session, p. 20, 1956.

[18] *Empirical Constants for Energy Conversion and Transmission*, Federal Inter-agency River Basin Committee, 1951, table 16, p. 18.

[19] *Op. cit.*, p. 23.

How should the private plant and the federal plant be compared in the event the government does not take the 10-year option if conditions at that time are such that, if the government had constructed a plant instead of making a long-term contract, the plant would be abandoned at the end of 25 years? The government would sustain an abandonment loss which would offset the difference in depreciation of the federal and private plants in the Krutilla-Peterson analysis for the 25-year period. However, there would remain the important factor that nearly $36 million of the $95 million of depreciation would be taken as an abandonment loss at the end of 25 years while in the case of the private plant this capital writeoff payment would have been made earlier as depreciation.

Although the Krutilla-Peterson paper refers to one feature of this aspect which belongs in the cost comparison, they do not evaluate or estimate it. I have not computed the additional interest which should be taken into account because of the capital writeoff differential between the two plants in the Krutilla-Peterson presentation.

However, I have carried through calculations with two methods of depreciation which differ from that of the Krutilla-Peterson analysis. In the first of these I retain the original Krutilla-Peterson 25-year amortization for the private plant and use double declining balance depreciation for the federal plant instead of their 35-year amortization. In the second, I use 35-year straight line depreciation for both plants.

The various comparisons which I make can be followed in Table I. Before account is taken of federal tax collection the 25-year advantage of the federal plant is reduced by $5,694,000 (row 4, cols. 1 or 2 minus col. 3) when double declining balance depreciation (35-year period) is taken on the federal plant and 25-year amortization is taken on the private plant. When 35-year straight line depreciation is take on both plants the 25-year advantage of the federal plant is reduced by $25,800,000 (row 4, cols. 1 or 2 minus col. 4). This reduction in the advantage of the federal plant takes place even though the federal plant advantage with respect to interest and profit *increases* by more than $10 million in each case (row 2, cols. 1 or 2 minus cols. 3 or 4). The increased capital writeoff for the federal plant more than overcomes the reduction in interest payment for the federal plant over the 25-year period.

Still referring to results before federal tax collection, there are no differences in capital writeoff for the 35-year period and the interest and profit advantage of the federal plant increases by $15,606,120 (row 12, col. 1 or col. 2 minus row 12, col. 3) when double declining balance depreciation is used in the federal plant and 25-year amortization is applied to the private plant. When both plants take 35-year straight line depreciation the increase in the advantage of the federal plant is $16,178,620 (row 12, col. 1 or col. 2 minus row 12, col. 4.)

For the 25-year period after federal tax collection the total cost advantage of the federal plant is reduced by $8,605,350 (row 9, col. 2 minus row 9, col. 3) when 35-year double declining balance depreciation is taken on the federal plant and 25-year amortization is taken on the private plant. When both plants take 35-year straight line depreciation the total 25-year cost advantage is reduced by $26,006,100 (row 9, col. 2 minus row 9, col. 4). These reductions in the total cost advantages of the federal plant for the 25-year period take place even though the interest and profit advantages of the federal plant increase by

TABLE I—Summary of Power Cost Differences (Private Plant Costs Minus Federal Plant Costs)

	(1)	(2)	(3)	(4)
		Depreciation Method		
Federal Plant	35-year amortization	35-year amortization	Double declining balance	35-year straight line
Private Plant	25-year amortization	25-year amortization	25-year amortization	35-year straight line
		Tax Method		
	Original (K-P)	Revised	Revised	Revised
At the End of 25 Years				
Before federal tax collection:				
1. Capital writeoff	$35,923,000	$35,923,000	$18,584,000	$ 0
2. Interest and profit	23,044,000	23,044,000	34,689,000	33,167,000
3. State and local taxes	15,200,000*	15,200,000	15,200,000	15,200,000
4. Total	74,167,000	74,167,000	68,473,000	48,367,000
5. Total excluding state and local taxes.	58,967,000	58,967,000	53,273,000	33,167,000
After federal tax collection:				
6. Capital writeoff	35,923,000	35,923,000	18,584,000	0
7. Interest and profit	20,234,000	10,413,000	19,146,750	20,330,000
8. State and local taxes	15,200,000*	15,200,000	15,200,000	15,200,000.
9. Total	71,357,000	61,536,000	52,930,750	35,530,000
10. Total excluding state and local taxes.	56,157,000	46,336,000	37,730,750	20,330,000
At the End of 35 Years				
Before federal tax collection:				
11. Capital writeoff	0	0	0	0
12. Interest and profit	24,911,380	24,911,380	40,517,500	41,090,000
13. State and local taxes	21,280,000**	21,280,000	21,280,000	21,280,000
14. Total	46,191,380	46,191,380	61,797,500	62,370,000
15. Total excluding state and local taxes.	24,911,380	24,911,380	40,517,500	41,090,000
After federal tax collection:				
16. Capital writeoff	0	0	0	0
17. Interest and profit	18,886,781	9,065,535	22,758,125	25,467,106
18. State and local taxes	21,280,000**	21,280,000	21,280,000	21,280,000
19. Total	40,166,781	30,345,535	44,038,125	46,747,106
20. Total excluding state and local taxes.	18,886,781	9,065,535	22,758,125	25,467,106

* I have reduced the state and local taxes from $35,625,000 to $15,200,000 for the 25-year period because the authors would have probably done the same if the information were available earlier.

** On the same grounds, the state and local taxes are reduced from $49,875,000 to $21,280,000 for the 35-year period.

$8,733,750 (row 7, col. 2 minus row 7, col. 3) when 35-year double declining balance depreciation is used for the federal plant and 25-year amortization is used for the private plant and by $9,917,000 (row 7, col. 2 minus row 7, col. 4) when both plants take 35-year straight line depreciation.

Again, this is reversed with the alternative methods of computing depreciation increasing the total advantage of the federal plant after federal tax collection for the 35-year period. When the federal plant takes 35-year double declining balance depreciation the advantage of the federal plant is increased by $13,692,590 (row 19, col. 2 minus row 19, col. 3). Straight line depreciation for both plants increases the federal advantage by $16,401,571 (row 19, col. 2 minus row 19, col. 4). The increases in the advantage of the federal plant for the 35-year period are due to the changes in interest and profit changes resulting from depreciation changes.

For the 35-year period the impact of the depreciation rate changes on interest costs is larger than the federal tax collection changes which I have applied to the original Krutilla-Peterson presentation. When the state and local tax payment on the private plant is put at the lower level the 35-year total cost advantage of the federal plant is $40,166,781 (row 19, col. 1) after federal tax collection. Applying my federal tax collection procedure to their calculations would reduce this advantage to $30,345,535 (row 19, col. 2). However, when the federal plant uses double declining balance depreciation the federal plant advantage is increased to $44,038,125 (row 19, col. 3) even when using my tax method. Straight line depreciation increases the advantage to $46,747,106 (row 19, col. 4). These results are due to the effect of the revised depreciation methods on interest payments over the life of the property.

Electric Utilities and Their Regulation in Iran

By RICHARD W. GABLE*

RECENT programs of technical assistance to underdeveloped countries have tended to focus on the economic aspects of underdevelopment. This emphasis is understandable since the general objective is to raise the productivity and thereby the standard of living of the people living in underdeveloped countries. However, equally important and frequently contributing to the economic underdevelopment of a country are political factors which are often more complex and difficult. Inadequate governmental policy and weak administration combine with such economic factors as lack of capital and skilled labor, primitive and inefficient methods of production, and faulty distribution to seriously impede progress and development.

Electric power is a basic necessity for economic development in any country. In Iran—ancient Persia—the power industry suffers from governmental policies and procedures which are not designed to encourage its development or its service to the people. The purpose of this article is to analyze and appraise government regulation of the electric industry in Iran. It will describe the present status of the electric industry. The character of the government's policies and administration of regulation will be analyzed, and the weaknesses of these policies and procedures will be appraised. Some of their adverse effects on industry and its services to the public will be pointed out and the requisites for a program of government regulation which would allow the electric industry to develop and improve its service to the public will be suggested.

The Electric Power Industry

Iran is a country of 19,000,000 people living on an area of 628,000 square miles (equivalent to the area of France, England, Scotland, Wales, Italy and Spain), one-sixth of which is uninhabitable desert and salt flats. Systematic efforts at industrialization have occurred only since the 1930's. The electric power industry dates from that period but most of the country's generating capacity has been built in the last few years.

Prior to the 1930's electricity was almost unknown in Iran. Around the turn of the century the Shah granted a concession to a Russian company to build a small plant to supply the royal court. By the time Reza Shah (the Ataturk of Iran and father of modern Persia) came to power in 1925 there were also several private plants owned by one man which supplied electricity for a few street lights and several prominent homes in Tehran. These plants had a generating capacity of about 600 kilowatts.

In 1935 a municipal electric plant was built in Tehran, Iran's capital and largest city, with the capacity of 6000 kilowatts. At that time the city had a population of about 400,000 people. The explanation for such a small plant being built at that time can be found in two versions of the same story which, though possibly apocryphal, undoubtedly contain a germ of truth. In 1932 Reza Shah decided that the time had come to provide the people with electricity. He instructed the Minister of Interior and the Mayor of Tehran to make a survey to determine the generating capacity

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needed to supply a specified area. The study revealed a need for a plant which could generate 60,000 kilowatts. However, the report to the Shah, through a clerical error, contained a figure of 6000 kilowatts. The error was immediately discovered, but no one had the courage to tell the Shah, with the result that the smaller plant was built.

According to the second version, the Shah himself made the decision to build the 6000-kilowatt plant after he had received the report. He asked what the generating capacity of the existing plants was. When told it was 600 kilowatts, he reflected a moment and announced that a plant ten times that capacity should be sufficient. Since no one ever refuted the Shah, the 6000 kilowatt plant was built. Both versions conform with the known character of Reza Shah and his regime. Certainly, in an Oriental despotism, masked behind the facade of a constitutional monarchy, either incident could have happened.

In 1934 a Czech firm won the contract to build the municipal plant and three years later it was in operation. In the next year or two the Electric Bongah, as the municipal plant is called, lost money because few people would subscribe. In fact, this has been true of most plants built in Iran where there has been no electricity before. At first the people did not see the need for it. Some people, in a land where government is dreaded, objected to it because it was a government operation. They viewed the application forms, the monthly bills, and other operating procedures as a further intrusion into their harassed lives. Besides, they had always lived without it, they did not have any appliances, and kerosene, to which they had become accustomed, was cheaper.

Over time people came to recognize the value of electricity; and the supply fell hopelessly behind demand, especially in Tehran. At the present time the entire installed generating capacity in the country is 253,000 kilowatts.[1] Eighty-five percent of this capacity is concentrated in twenty-six load centers, of which Tehran is the principal one.

There are fifty different power generating entities in the city of Tehran with a total capacity of 62,010 kilowatts, although their actual capability is only 56,870 kilowatts. Twenty-nine of these are privately-owned utility companies, fourteen are government-owned industrial power plants, six are private industrial power companies, and one is the municipally-owned utility company. The Electric Bongah has a capacity of 18,460 kilowatts, more than the total capacity of the private utilities. A total of approximately 94,700 consumer units now derive the benefits of electricity, 58,700 from the Bongah and 36,000 from the private utilities. Actually, not all of the consumers who draw electricity from the Bongah are direct customers. An estimated 15,000 consumer units are sub-connected with customers of the Bongah and pay the customers rather than the Bongah for the electricity they use. The 58,700 includes these sub-connected customers.

The number of persons now living in Tehran exceed 1,600,000, while the metropolitan area encompasses a population of over 1,800,000. The number of potential customers is at least three and one-half times the number now being served so the demand is far beyond present capacity. To attempt to satisfy the needs of all its customers the Electric Bongah has had to buy electricity from a

[1] For these and other statistics on the power industry in Iran the writer relied upon the report of the nationwide electric power survey conducted by Sanderson and Porter Engineers (New York), under contract to the Seven Year Plan Organization. The survey was carried on between February and November of 1956.

number of government-owned businesses and industries which generate their own power, such as the munitions factory, the railway factory, the cement works, the national bank and the mint. The agreement is that the Electric Bongah supplies these plants during work hours. In return, they provide the needs of the municipal company during the peak evening hours. Some of the private utilities also supply the Bongah with electricity during certain hours.

Throughout Iran much power distributed to retail customers is generated as a by-product of an industrial enterprise. The generating entity has a primary interest in some activity other than the power business. In some areas, including Tehran, industrial plants may close down their industrial activity during peak hours and sell their electricity at wholesale for distribution by the utility companies.

Most plants use diesel engines to turn the generators although there is a steam station at the Abadan Oil Refinery and a few steam turbines elsewhere. Some of the equipment is modern, adequate, and efficient. Unfortunately, the equipment is often poorly maintained and much of it has fallen into disrepair. A recent survey of 183 generators in Tehran revealed that only seventy-nine could be classed as being in good condition, seventy-nine in fair condition, twelve in poor condition, and thirteen in bad condition. Outside of Tehran the situation is worse. Moreover, distribution networks are antiquated, inadequate, and, in some cases, actually dangerous. Energy losses may run as high as fifty percent due to weak and inadequate distribution facilities—and theft.

In the absence of government regulation of service, because of poor and inadequate facilities and inefficient management, most areas in Iran do not receive satisfactory service. With few exceptions all systems are greatly overloaded. During periods of peak use voltage may drop to one-half or even one-third so that appliances are rendered useless. Service is sometimes rotated among districts so that each district will be without power on a regular, or irregular, schedule. Second-class customers of the municipal system in Tehran are permitted only forty kilowatt-hours consumption per month; if they exceed that amount, service is discontinued. During peak load periods, uses for other than illumination may be prohibited. Breakdowns are common and no provision is made for reserve facilities. During the year a customer may be without electricity for ten or twelve hours at a time for as many as ten to twenty days. Some producers may simply suspend service during low periods of use to inspect and service their equipment.

Because of the great demand and limited supply, people are willing to pay extravagant amounts for service. Application fees and/or connection charges may run as high as $200 or more; they are seldom less than $60 or $70. (By comparison, a telephone in Tehran costs $600 to $900.) The number of paid-up applicants is great. In some instances the number may be as many as one-half of those receiving service. The provisions for repayment of application fees are vague and no stipulation is ever made as to the time service will be provided. People may have to wait as long as eight years to get service. The fact that deposits, when loaned in the bazaar, bring between twenty and thirty percent interest is sometimes a deterrent to speedy connections.

The extreme shortage of electricity has had the tendency of restricting service to well-to-do customers with whom appli-

ances have become popular. Outside the cities the average customer has few appliances. He may use twenty-five watt bulbs in three or four outlets and nothing more. Moreover, the difficulty of obtaining service has given rise to the idea that power is a luxury. When power is regarded as a necessity, as in the case of industrial establishments, it is provided by the user himself.

The utility companies are partially to blame for the power shortages in Iran. Private enterprise in Iran is limited almost entirely to ventures which can be undertaken by a single proprietor or a family group. The corporate form of business is seldom used. Consequently, large power installations are not built because they cannot be financed by single proprietors or partnerships. Many private companies generate only a few hundred kilowatts.

The feeling exists among both public and private operators that potential customers should subscribe a large part or even all of the cost of new systems in advance. For example, when the Electric Bongah added an 8000-kilowatt generator five years ago, the people who could obtain electricity from this additional capacity were only those who loaned the company 6,000 rials ($78.94)[2] with which to buy the generator. Thus, there is a tendency to make small installations and extensions the output from which it is already committed when the generator is installed. A plant is never built with an eye to actual or prospective demand. In Tehran, for example, the twenty-nine private utility companies, all but one of which have sprung up during the last four years, have a capacity of only 17,750 kilowatts. Many of the plants serve the same area and have parallel lines running down the same streets. The motivation behind the establishment of some of these plants has been the desire of the proprietor to serve himself and his family; what he does not need he sells to his neighbors.

Private utilities follow the Persian business practice of attempting to pay off the investment within a few years, possibly as few as five. The result is inferior equipment, little or no maintenance, overloading the system, and poor service.

Government Regulation of Electric Utilities

Principal repsonsibility for the sadly inadequate power industry in Iran, however, rests with the government. Both the philosophy that underlies government regulation and the procedures of regulation impede and obstruct the development of electric power. This criticism is not directed against regulation as such. It is assumed that public utility regulation is essential to promote the public interest. The problem in Iran is in the nature of the regulation.

The public utility concept does not exist in Iran. The regulatory agencies are ill-equipped to do their job and their procedures are clumsy and unsound. Service regulation is virtually nonexistent and, while rates are regulated, no systematic effort is made to relate the rates to objective standards. The resulting rate schedules have the effect of hampering the growth of the electric inindustry without assuring the consumer that the charges are fair and reasonable.

The Public Utility Concept. Effective regulation of certain businesses, like the electric industry, requires that its public-service character be recognized. In the United States a number of businesses have come to be designated in law as "public utilities." These are businesses that legislative, administrative, and judicial bodies regard as being so impressed with peculiar public interest as to justify

[2] Figuring the rial at the present exchange rate of 76 rials to the dollar.

intensive government regulation of practically every detail of their activities.

The public utility concept is essentially a legal concept. The process by which a particular business acquires public utility status is the political process by which a felt need is satisfied through government action. The path leading to legal controls may be marked by the growth of public opinion in favor of the regulation, followed by legislative enactment of the control. A regulatory agency may be vested with the authority to administer the details of regulation and the courts may, from time to time, be called upon to interpret the law and settle disagreements.

No such concept exists in Iran and few people understand its significance. The legislation which provides for regulation of the production and supply of electricity is rudimentary in character and establishes no objectives to be achieved or any standards to guide regulation. Regulation is not dedicated to the end that power-generating companies must live up to special requirements as businesses which serve the public interest.

The Regulatory Agencies and Their Procedures. Electric utility regulation is a complicated procedure in Iran (if and when it is relied upon) which involves three different agencies and a series of *ad hoc* commissions, although the Minister of Interior has ultimate responsibility. The municipal electric company in Tehran sets its own rates, subject to review within the Ministry of Interior. Rates in the Electric Bongah are arrived at after the Director General asks the various sections of the Bongah to give their views as to what the rate ought to be. Sometimes he may consult all the sections, or he may consult none.

The recommendation of the Director General goes to the Board of Directors of the Bongah, which consists of a representative from the Ministry of Interior, a representative of the Municipal Council (which has not been reorganized since it was abolished a number of years ago), and a representative of the Mayor. The decision of the Board is supposed to be sent to the Municipal Council for approval but, since it does not exist, goes to the Electricity Section of the Ministry of Interior for approval.

The private electric utilities in Tehran are controlled through the Division for Regulation of Private Electric Companies, an office within the municipal government of Tehran. The Division acts as little more than a secretariat in matters involving rate and service regulation. It supervises the collection of data related to rates and publishes the rate schedules, while an *ad hoc* commission appointed by the Mayor sets the rates. This commission usually consists of a representative from the Division, one from the Electric Bongah, one from the Seven Year Plan Organization, one from an association of private electric companies, and possibly one from the national parliament. This body goes out of existence after it has determined the rates and a new one must be appointed when another rate issue arises. Or, if the Mayor chooses, cases involving electric-utility rates may go to the Rate Regulation Commission which was established to set bus rates and the prices of milk and meat.

Applications from private companies for entry into service or extension of service are also submitted to the Division which forwards it to another *ad hoc* commission. In these cases the commission is composed of the chief of the Division, two representatives from the Electrical Bongah, one from the Ministry of Interior, and one from the Department of Municipal Administration in the Ministry of Interior.

Rate proposals from the Electric Bongah and the Division for Regulation of Private Electric Companies, as well as from other cities in Iran, are reviewed by the Electricity Section, which is a part of the Technical Office in the Department of Municipal Administration. A special commission is appointed to handle rate cases. The membership of this commission varies, but usually it consists of eight or nine persons. These may include representatives from the municipality, the Bongah, the Ministry of Interior, and the Plan Organization. This, too, is an *ad hoc* body which goes out of existence after it has reviewed a case.

In reviewing rates for cities other than Tehran, the Electricity Section follows somewhat different procedures. The Section has comparative rates for the whole country and it attempts to keep rates within each locality comparable. In addition, it is admitted, local politics play a part as does, in all rate determinations, the Middle Eastern practice of baksheesh.

The recommendations of the Electricity Section are reported to the Minister of Interior, who is the final authority on all rate matters. There is no further appeal. Neither the Section nor the Ministry of Interior sets any service standards.

Regulation of Rates. Ordinarily, the purpose of utility regulation is to promote and protect the interest of consumers, investors, and the general public. This purpose is accomplished by regulating the rates charged, quality and quantity of service, and accounting and financial practices and transactions.

Although the legal provisions which guide the process of rate fixing might vary widely, a logical and reasonable approach is to focus attention on the value of the property used for the production of electric energy, operating expenses, and a rate of return to be calculated on these factors. This approach is unknown in Iran and no other systematic, objective approach has been developed. The regulatory agencies have no rational method of arriving at rates, they have no standards or criteria to guide them, and uniform accounts or periodic reports are not required.

An effort is made to calculate out-of-pocket expenses so that operating costs can be reflected in the rates. However, the regulatory agencies set forth no criteria as to what is considered a legitimate operating expense and no investigation is made to determine the reasonableness of these figures. Moreover, the agencies do not require that an estimate be made of the cost of the capital plant in determining rates. Hence, the problem of original versus reproduction costs never arises.

Strangely, depreciation is not taken into account in figuring operating expenses, so no allowance is made for loss in value of plant and other equipment. This fact may be one of the explanations for the poor maintenance of company equipment. Another explanation is the general attitude most people seem to have toward the care of property and equipment. Iran has been described as a country where everything disintegrates. Through shabby neglect houses begin to fall apart as soon as they are built.

In the whole process of negotiating a rate, a utility company may use a variety of inducements to convince the regulatory agency of the merits of its presentation, a practice which is not uncommon in a number of business and governmental activities in this part of the world.

When the Electric Bongah was first organized the rates were set by a Ministerial Council (composed of heads of ministries) of the Government of Iran.

The Council had no basis for setting the rates—no cost data or other statistics—but the rates had to be fixed so it agreed on a rate of .6 rials (1.8¢)[3] per kilowatt-hour for electricity consumed during twenty hours designated as day hours, and 2 rials (6.2¢) per kilowatt-hour for electricity used during the four peak hours at night. Industrial users paid .75 rials (2.3¢) per kilowatt-hour. These rates were recognized as being excessive for those times. However, the day rate was found to be too low to cover operating costs so it was soon raised to .8 rials (2.5¢) per kilowatt-hour. At the same time the industrial rate went up to 1 rial (3.1¢) per kilowatt-hour.

In 1946 a surcharge was added for large consumers like movies, restaurants, dining halls, places of recreation, and big shops to discourage excessive use of electricity. This amounted to an additional rial per kilowatt-hour for every kilowatt-hour used in excess of thirty.

Two years later the rate schedule now being used by the Bongah was put into effect. The striking thing about this schedule is that rates go up as the amount of electricity consumed increases. Night rates are now 2 rials (2.6¢)[4] per kilowatt-hour for the first twenty kilowatt-hours, 2.5 rials (3¢) per kilowatt-hour for the next thirty, 3.5 rials (4.6¢) per kilowatt-hour for the next fifty, and 5 rials (6.5¢) per kilowatt-hour for everything above one hundred kilowatt-hours. The day rate is a flat 1.5 rials (1.9¢) per kilowatt-hour. Commercial users are charged a flat 1.25 rials (1.6¢) per kilowatt-hour up to 5000 kilowatt-hours and 1.15 rials (1.5¢) per kilowatt-hours thereafter.

These rates are more meaningful in light of the average earnings of an Iranian and the great increase he has suffered in his cost of living. In the last twenty years the general cost of living has multiplied 11.5 times. Rent, as a single item in the general cost of living, has increased twenty-five-fold. The average laborer in Tehran earns only 50 rials a day (65¢); in the villages he earns much less. The monthly electric bill for the writer in Tehran is a little more than a laborer earns in a month.

The objective of the Electric Bongah is to set a rate which just clears costs. There is no intention of including a specific rate of return for profit, future expansion, or other contingencies. However, the Bongah finds itself unable to make a definite and accurate estimate of the cost of its capital plant and other costs. In fact, it is only since 1948 that the Bongah has any record of income and outgo. At this point, all the Bongah can report about the present level of rates is that it is showing a surplus of income over out-of-pocket costs.

The Division for Regulation of Private Electric Companies attempts to make a calculation of costs and then allows a rate of return of ten percent. This profit is comparable to the official interest rate charged by Bank Melli, the national bank of Iran.

The rates for private utility companies in Tehran are not supposed to exceed the rates charged by the Electric Bongah. The present rates average around 3 rials (3.9¢) per kilowatt-hour. If a company exceeds the allowed rate it may be brought into court and fined not less than 15,000 rials ($197). Sometimes rather high fines for over-charging have been imposed.

Outside of Tehran electric rates vary by districts. More than half of all domestic and commercial power is sold at 5.3¢ per kilowatt-hour. In many districts rates are 6.7¢ per kilowatt-hour

[3] Figuring the rial at the time to be worth 32 rials to the dollar. However, the general cost of living in those days was 1/12 of what it is today.

[4] By this time the rial had fallen so that it was worth between 75 and 82 rials to the dollar. These values are calculated at the present rate of 76 rials to the dollar.

and they may go as high as 13¢ per kilowatt-hour. In addition, a heavy tax is imposed by the municipalities throughout Iran on the consumption of electricity substantially increasing its cost. This tax dates from 1940 when it was decided that a tax on the use of electricity was needed to replace the loss of income suffered by the cities as people switched to electricity and revenues from the kerosene tax declined. This tax amounted to one-half the night rate and one-third the day rate. The Minister of Finance was authorized to reduce or eliminate the tax on electric power used by public and charitable agencies. No tax was levied on industrial use. Two years later an additional tax of 20 rials was imposed on every consumer of electricity.

At the present time a tax of 1 rial (1.3¢) per kilowatt-hour is added to the night use of electricity supplied by the Electric Bongah. The day use of electricity is taxed .5 rial (.65¢) per kilowatt-hour up to 1000 kilowatt-hours and .25 rials (.3¢) per kilowatt-hour for any consumption above that amount. Industrial users pay no tax for consumption under 2500 kilowatt-hours and a tax on .25 rials per kilowatt-hour for anything above that.

Regulation of Service. None of the self-regulation performed by the Electric Bongah is concerned with service regulation. Nor does the Electricity Section of the Ministry of Interior set service standards. Rates are their only consideration. However, some attention is given to service regulation by the Division for Regulation of Private Electric Companies.

Theoretically, entry into service is regulated. Private utilities are not supposed to operate in the city of Tehran where service is provided by the Electric Bongah. In fact, they do. Private companies which do operate within the city are supposed to sell their power to the Bongah at wholesale for distribution by the Bongah. Actually only a small part of their power is distributed through the Bongah.

When a company wishes to go into the electric utility business it is supposed to submit an application to the Division for Regulation of Private Electric Companies which forwards it to an *ad hoc* commission composed of the chief of this Division, two representatives from the Electric Bongah, one from the Ministry of Interior, and one from the Department of Municipal Administration. This application should include a map of the area to be serviced and the location of the plant, along with a statement of plant specifications. When a new company comes into existence it is supposed to be able to service its area satisfactorily for at least five years. At the end of five years, if the plant is located within Tehran and the Electric Bongah can supply the needs of the consumers in that area, the Bongah can buy the plant. Private companies thus forced out of business in Tehran have first priority in establishing a plant outside the city. However, all of the existing private utilities in Tehran came into existence before this procedure was established. At the time they were created no requirements for entry into service existed.

A similar procedure is required to obtain approval for extension of service; the Division has handled a number of these cases. An effort is made to assign specific areas to each of the private companies so that duplication of facilities is prevented. Within the assigned area extensions can be made without prior approval. If it happens that a company extends service into another company's area, the company may be fined but the fines are light and it is generally felt that the extra supply of electricity that is

made available is a gain. If the extension beyond an assigned area is into an area that has not been assigned to another company, no objection is raised, even if the extension had no prior approval. Occasionally, involuntary extensions can be required by threatening to cut down the area assigned to one company. To keep its area intact a company may extend service to customers it had previously chosen not to serve.

There are few standards of service established to guide the performance of private electric utilities. The kind of meter used and its accuracy and maintenance are a concern of the company only. The sole requirement is that the meters must be sealed at the plant to prevent tampering. Extra generators are supposed to be available to cover breakdowns. The companies are supposed to keep books of revenues and expenses. The plants are supposed to be constructed according to "technical principles."

Occasionally, complaints about service may come to the Division and these may be investigated. If, for example, service is interrupted too frequently, the company may be warned to improve its service. If a customer is disconnected without reason, a connection may be ordered and the company must stand the expense of reconnection. If the disconnection is repeated, the company is in danger of having its permit cancelled.

Appraisal and Conclusions

As an underdeveloped country Iran is in dire need of inexpensive, abundant and reliable electric power. Through its regulation of electric utilities the government of Iran has been responsible for impeding and obstructing the development of the electric industry.

Utility regulation should protect the consumer and the investor without injuring the industry. Public utility regulation in Iran offers little protection to the consumer and hampers the growth of the electric industry. The concept of public service is virtually non-existent. Too often electric power is regarded as a luxury rather than as a necessity. Service is poor and inadequate. Application and connection fees are exorbitant. Rates reflect neither the cost nor the quality of service. The consumer accepts these conditions because he has no alternative.

Rate determinations are made through a cumbersome procedure by persons who have little or no knowledge of the problem and no adequate data for arriving at a decision. No standards for rate-fixing have ever been established in law and systematic accounts and reports are not required. The *ad hoc* character of the rate-making bodies prevents the development of expertise among the members and disrupts continuity. Whim and caprice seem to guide determinations.

The ascending rate schedule is presumably designed to discourage the use of overtaxed facilities and to subsidize the small consumers. But such a schedule is contrary to the decreasing-cost concept of electric power generation. The annual fixed cost of installations and generating facilities constitute the largest part of the cost of produced power. The annual cost per unit of power decreases as the number of these units increases. The consumer should be able to benefit from this reduction of cost.

Moreover, the rate schedules make no concession for the use of off-peak energy even though it can be produced for little or nothing. The single rate for all consumption and the ascending rate, along with the high application and connection fees, all deter the development of the industry. The high tax levied on the use of electric energy further discourages its use and impedes the growth of the industry.

The number of private electric companies in Iran has mushroomed in recent years. These plants are often poorly planned and maintained, their capacity is small, the quality of service is low and their services may duplicate each other. Standards for entry into service and quality of service are non-existent or inadequate. The excessive demand for electric power forces small generating units and their networks to be overloaded. When the load exceeds the nominal boundaries, the cost of the energy produced becomes so high that it is economically unprofitable. Maintenance of equipment becomes difficult and, without financial provisions being made for depreciation, equipment wears out far before its expected life.

Little attention seems to be given to the fact that under equal conditions large generating units have higher efficiency than small and scattered generating facilities. No effort is made to plan the development of the industry, or encourage consolidations and inter-connections, except as the municipal system in Tehran finds its supply of electric energy insufficient to supply its customers and it must borrow power from other producers. The regulatory system in Iran is simply not effective in preventing anarchy in the electric industry.

Iran is not unique in being confronted with these problems. Other countries in similar stages of development faced comparable problems. In the United States in the latter part of the 19th century the electric utilities in the large cities experienced the same, or worse, conditions. Effective regulation came slowly and haltingly and constant vigilance was necessary to protect the gains that were made. Iran should profit from the experience of other countries. No law of progress requires that a country must suffer through the mistakes other nations endured before it makes advancements. Iran has the opportunity to skip the failures and weaknesses of half a century of experience with utility regulation.

Obviously, the solution of Iran's electric power problems requires a variety of approaches. Additional capital is needed, power sites must be developed, technicians (to install and maintain plants) and equipment must be trained, and so on. Already progress is being made. Iran has the potential of vast capital from its oil industry. The Seven Year Plan Organization, which receives and spends for development purposes approximately eighty percent of the country's oil revenue, has budgeted over a seven-year period 1.5 billion rials (almost $20 million) to aid municipalities on a matching basis develop electric utilities and 978 million rials (almost $13 million) for the installation of hydroelectric and steam generating plants. Through the combined efforts of the Government of Iran and the International Cooperation Administration steps are being taken to attract private foreign capital. The firms of Sanderson and Porter and of Lilienthal and Clapp are under contract to the Plan Organization to aid in the development of river valleys and other power sites. The services of the United States Operations Mission to Iran are available to assist these developments in every possible way. But, until the basic problem of philosophy and procedure of government regulation of the electric industry is solved, the future development of the industry will be impaired.

The objective of utility regulation should be to encourage the growth and expansion of an electric industry which is efficient and adequate to serve the public at the lowest possible cost. Electricity is an essential commodity and should not be regarded as a luxury which is available

only to a few. Public policy should declare the concept of public service to be the guide of utility regulation.

A single, permanent regulatory agency vested with authority to develop an overall plan for the electric industry, bring about consolidations and interconnections, and regulate the service and rates of electric utilities should be created.

The primary interest of public-utility consumers is in securing good service. This fact has sometimes been overlooked in controversies over rates, financial practices, and public ownership. Standards and criteria should be established in law for entry into service, abandonment of service, extension of facilities, discrimination in service, and quality of design and service. The regulatory agency should be entrusted with the interpretation and application of these standards, subject to outside review.

Criteria and standards to guide the regulatory agency in fixing rates should also be set forth in law. A utility should be required to file its rates, rules and periodic reports with the agency. The agency should have the power to require uniform accounting. Accounting regulation and the requirement of periodic reports provide the means of effective control of public utilities. In order to ascertain reasonable rates, approve security issues, prevent falsification or distortion of financial records, a regulatory body must have accurate, systematic, and uniform information about operating expenses and capital expenditures. The classifications and instructions which the agency provides should, of course, conform with accepted business and accounting principles.

In addition to improving its policies and procedures of utility regulation, Iran might reflect on the experience of the Tennessee Valley Authority in the United States, an honest and efficiently run public power authority. The TVA fixed its rates at a level which was extremely low in comparison to the prevailing rates of private companies. Through the prod of competition the TVA succeeded in forcing private power companies to improve their service and lower their rates. As David Lilienthal, who served as a director of the Authority from 1933 to 1946 and as chairman from 1941 to 1946, explained: "It has been demonstrated here, to the benefit both of consumers and utilities, that drastic reductions in electric rates result in hitherto undreamed-of demands for more and more electricity in homes and on farms . . . . It has led all over the country to a realistic re-examination of the financial feasibility of low rates."[5] In other words, the TVA used public risk capital to prove to private enterprise the elasticity of demand for electric power in rural areas, a speculation that private industry would not hazard.

The immediate result was a phenomenal increase in consumer demand for electricity. Before the power program of the TVA was put into effect, the Tennessee Valley had the lowest per capita use of electricity of any part of the nation. Ten years later it was second highest in the nation, and the rate of increase was twice that of the country as a whole. In the face of this competition, the revenues of private companies actually increased. The introduction of reduced rates has greatly expanded the income and improved the financial condition of the private power companies, including those affected by the TVA's program. To the extent that the TVA's policies brought rate reductions and expanded sales, it can certainly be given

[5] *TVA: Democracy on the March* (New York: Harper & Brothers, 1944), pp. 3-4.

credit for success in obtaining the objectives. Of course, one cannot be sure that private companies might not have done the same in the course of normal aggressive business operations. It seems almost certain, however, that the TVA's program accelerated this development.[6]

[6] For a more extended discussion, see Harold Koontz and Richard W. Gable, *Public Control of Economic Enterprise* (New York: McGraw-Hill Book Company, 1956), pp. 688-695.

Among Articles to Appear in *Land Economics*

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Forest Taxation in the Northern Half of the Lower Peninsula of Michigan

By LEE M. JAMES* and JAMES G. YOHO**

THIS paper is a discussion of general property taxes and forest yield taxes as factors which may influence forest management in a region. It is based on a general inquiry as well as specific field data obtained in 1954 and 1955 during the course of a detailed study of private forest landownership and management in 31 northern counties of the Lower Peninsula of Michigan.[1] A recent report[2] on the detailed study did not include any discussion of forest taxation.

The procedure and sampling technique used in the detailed study are described elsewhere.[3] Only a few of the sampling features pertinent to the discussion of forest taxation are outlined here.

The field sample was tied to 3,046 forested forty-acre blocks located in the study area as part of the Forest Survey conducted by the Lake States Forest Experiment Station. Township supervisors, who were canvassed by mail, were asked to list owners of these sample forties, their addresses and occupation classes. Where addresses were known, but not occupations, a supplemental questionnaire was sent to the individual landowners. The total response identified owners and their occupations for 1,556 sample forties. Based on this sample, forest area was calculated by owner-occupation classes.

From the owners of sample forties, whose names, addresses and occupations were identified, a smaller sample was selected for field interview. A total of 229 forest landowners was interviewed and allocated to occupation classes on the basis of the square root of the population in each class. Actual selections for interview were drawn at random.

General Property Taxes

The general property tax, as it applies to forest properties, has long been considered a major problem by those concerned with forest conservation. Numerous studies have been made and theories advanced concerning the influence of property taxes on the handling of the forest resource. The opinion has been expressed that the tax system has socially undesirable effects upon the conservation decisions of private planning agents.[4]

One concern of foresters about the general property tax stems from the magnitude of the property tax as a cost burden and possible deterent to conservation thinking among forest landowners. Another concern is a consequence of the lack of annual sustained timber yields on most forest properties. The general property tax requires annual payments on the assessed value of real property, but annual income from which to pay annual taxes on forest properties often is not available. The usual pattern in income is extremely variable, large in some years, small or entirely lacking in other years. Particularly on small properties,

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[1] Roughly, 31 counties north of an irregular line drawn from Bay City to Muskegon. The study area will be referred to as northern Michigan throughout this article.

[2] James G. Yoho, Lee M. James and Dean N. Quinney, *Private Forest Landownership and Management in the Northern Half of the Lower Peninsula of Michigan*, Michigan Agricultural Experiment Station Technical Bulletin 261, East Lansing, 1957.

[3] Yoho, et al., *op. cit.*

[4] S. V. Ciriacy-Wantrup, *Resource Conservation, Economics and Policies* (Berkeley: University of California Press, 1952), p. 168.

many years may elapse between successive incomes.

Historical Influence on Forestry in Northern Michigan

During the peak era of timber depletion (1860 to 1890) in Michigan's great pine forests, local governmental services were developed to provide for the population which had associated itself with the lumbering economy. Often these governmental costs exceeded actual need because the development of a sound and flourishing agricultural economy was expected to follow logging. Such development did not always materialize but once services were launched it seemed politically and administratively difficult to reduce them. While governmental needs for revenue remained uniform or expanded, the tax base (including production potential) from which revenue could be extracted steadily shrank as logging progressed. To counteract this shrinkage tax rates were steadily increased. For example, annual forest land taxes in the northern half of the Lower Peninsula of Michigan increased from an average of $0.27 per acre in 1900 to $1.06 in 1925.[5]

The burden of the property tax played some role in the excessive liquidation of Michigan's old-growth forests, although the Forest Taxation Inquiry did not consider taxation to be the primary factor.[6] Where the annual property tax has proved most burdensome is in its application to cut-over lands. Through the "cut-out-and-get-out" era of logging, landowners were often unwilling to pay high annual taxes on lands that would not yield additional income in the foreseeable future. Millions of acres of cut-over lands were forfeited for non-payment of taxes. Eventually, much of this land came into state and federal ownership.[7]

Land forfeiture for nonpayment of taxes, which was high even before the turn of the century, continued to increase parallel with the increases in tax rates. The culmination was reached about 1933 when a constitutional amendment in Michigan limited property tax rates to 1.5 percent of assessed valuation.[8] Other means of taxation were forced into prominence. More than 80 percent of Michigan's local and state revenues was derived from property taxes in 1900, but only about 40 percent was derived from the same sources in 1935. Since 1935 the percentage has remained near the lower level; it was reported to be 43 percent in 1954.[9]

Current Influence on Forestry

Does the general property tax now constitute an obstacle to forestry in northern Michigan? The question does not need to be considered in relation to forfeiture for nonpayment of taxes be-

[5] F. R. Fairchild, et al., *Forest Taxation in the United States*, United States Department of Agriculture Miscellaneous Publication 218, Washington, D. C., 1935, p. 249.

[6] Fairchild, et al., *op. cit.*, p. 278. The report concluded: "It [taxation] is a contributing factor, however, since the property tax favors old-growth timber properties operated as a 'mine' and tends to accelerate the cutting of timber on such properties. But the item of interest on invested capital, in general, greatly overshadows taxes as a carrying charge, and it is the fear that the forest investment will not earn this interest in the future that is the principal factor leading to excessive cutting. A timber owner who is not prevented from promoting his own best interest by financial or psychological pressure will cut his timber when, and only when, he has become convinced that the increase in its value will no longer keep pace with the carrying charges. Taxes constitute only a part of these carrying charges."

[7] Some 3.3 million acres of state-owned lands came into state ownership via the route of tax delinquency. *See* Michigan Department of Conservation, *Seventeenth Biennial Report*, 1953-1954, Lansing, p. 205.

[8] The constitutional amendment limited the total combined tax rate in any township to 15 mills. The limitation was not absolute, since provision was made for an increase to raise revenue for interest on debts previously incurred. Also, assessment districts could increase their tax rates up to a maximum of 50 mills for a 5-year period upon approval by a two-thirds vote of the electorate. Under the limitation, the maximum tax rate is predetermined and the amount of the maximum levy becomes fixed so long as the total valuation remains unchanged. The immediate effect of the constitutional amendment was to produce a large reduction in rural property taxes.

[9] Michigan Department of Revenue, *Annual Reports, 1937-1938* to *1953-1954*, Lansing.

cause such forfeiture has become insignificant since World War II.[10] What is more pertinent is whether the property tax is sufficient in itself to discourage forest landowners from sustained-yield operations. In the light of sustained-yield requirements, do owners harvest timber prematurely and too extensively because of the burden of property taxes?

The range of forest property taxes in northern Michigan is shown in Table I. The most common tax bracket is 10 to 14 cents per acre, and 89 percent of the forest is taxed at less than 25 cents per acre. The weighted average of 18 cents per acre[11] is a far cry from the $1.06 per acre average determined for the same region by the Forest Taxation Inquiry in 1925.

Generally speaking, these taxes do not appear burdensome. Some owners feel their properties are overassessed, a situation which is not peculiar to any one region, but very few of the landowners interviewed indicated much concern over their present forest taxes and none of them suggested that their forest management decisions were influenced in any way by this item of cost.

TABLE I—General Property Taxes per Acre of Forest Land in Northern Michigan

Taxes	*Forest area*
Cents per year	Percent
Below 10	8
10-14	35
15-19	24
20-24	22
25-29	3
30-34	1
35 and up	7
Total	100

Forest landowners living on their property pay slightly higher taxes than average (Table II). These owners are mainly farmers. Their forest holdings contain more valuable timber than average, and it may also be presumed that assessed valuations are influenced by proximity of forest to farm land. In the 1-25 mile distance category, taxes also average somewhat higher than for the whole owner population, influenced mainly by a concentration of industrially-held lands taxed at 35 cents or more per acre. With these exceptions there is a decided trend toward higher taxes with increasing distances of owners from their properties.

TABLE II—General Property Taxes per Acre of Forest Land in Northern Michigan, by Distance of Owner from Property

Taxes	Distance from property in miles				
	On site	1–25	26–100	101–200	201 and up
Cents per year	*Percent of forest area*				
Below 10	9	14	1	0	0
10-14	17	34	85	32	0
15-19	23	21	11	43	33
20-24	47	10	*	25	44
25-29	3	2	3	0	19
30-34	0	2	0	0	0
35 and up	1	17	0	0	4
	100	100	100	100	100

*Negligible.

In appraising the management influence of the forest tax structure, it must be recognized that, to an ever-increasing degree, values other than timber production are shouldering the burden of taxes and other costs of ownership. Nineteen percent of the private forest in northern Michigan (held by 39 percent of the owners) has recreation or residence as the primary objective of ownership. An additional 18 percent of the forest is held for investment or speculation, primarily

[10] Some 19,000 acres in Michigan reverted to the State in 1945, 6,000 acres in 1946, and smaller acreages in succeeding years down to 380 acres in 1945. See Michigan Department of Conservation, *op. cit.*, p. 206. Under the General Property Tax Law, lands which have been tax delinquent for three years are offered at tax sales by the county treasurer. If the tax liens are not sold, the descriptions are bid off to the state: and if not redeemed within one year following the sales, they are deeded to the state.

[11] A recent (1953) study reported an average tax of 17 cents per acre and a median of 12.5 cents per acre on private lands in northern Michigan considered to be similar to lands held by the Michigan Department of Conservation. *See* John H. Eichstadt, *Payments in Lieu of Taxes on Public Lands Under the Jurisdiction of the Michigan Department of Conservation*, University of Michigan Papers in Public Administration, No. 16, Ann Arbor, 1956, p. 14.

in anticipation of future recreational values.[12] On these properties, on the 31 percent of the forest which is held in conjunction with farms, and on the 19 percent held for watershed and other nontimber objectives, timber production is often a secondary purpose of ownership. Timber production is not expected to pay for all the costs of ownership.

The situation is different on the 13 percent of the forest held primarily for timber production.[13] On these properties, the property tax must be weighed against the revenues derived from timber sales, and it is apparent that current timber-producing values are low. Privately-owned forests in northern Michigan are generally characterized by small tree sizes, poor tree stocking and, consequently, small average timber volumes per acre.[14] Growth rates are low, income must frequently be deferred until timber reaches merchantable sizes, and the sale value of products is usually low.[15]

Property taxes presently being levied on forests in northern Michigan are considered more burdensome by the owners dominantly interested in timber production than by forest landowners at large, but they are not often considered a handicap to sustained-yield timber management. They may stimulate some landowners to seek tax relief through the provisions of the Commercial Forest Reserve Act, for example, but the concern shown is more with the possible future course of property taxes than with the present level.[16]

Whatever criticisms may be leveled by forest landowners against the magnitude or equitability of the property tax, it is not presently discouraging a significant number of forest landowners from practicing sustained-yield forestry. Private timber management in the region is generally poor, but the reasons for this lie outside the property tax. The outstanding reason recognized by forest landowners in northern Michigan for their failure to improve cutting practice is their inability to supervise because of physical limitations or demands of more remunerative activity.[17] Other prominent explanations offered by owners are the obstacles of distance, which reduces the opportunity for supervision, unfulfilled hopes of clearing forest for pasture or other land use, lack of interest in timber production, and owners' inability to get logging contractors to cut conservatively. Two explanations which might be related to the property tax burden—"immediate need of liquidating timber for cash" and "expected returns of management do not justify the necessary costs"—together apply to less than 0.5 percent of the forest areas.[18] It is difficult to detect in the explanations any suggestion that property taxes induce more than a negligible number of forest landowners to refrain from sustained-yield forestry.

Forest Yield Taxes

A forest yield tax has been suggested frequently and tried extensively as a substitute measure for the general prop-

[12] Yoho, et al., *op. cit.*

[13] Yoho, et al., *op. cit.* On 7 percent of the forest, the primary objective is the sale of mature timber. Owners of 4 percent of the forest are interested mainly in growing timber for sale. Wood-using industry holds 2 percent of the forest.

[14] *Ibid.* Only 7 percent of the privately owned forest can be classed as sawtimber stands; well over half the area is in stands below pole-timber size. A full fourth of the area is nonstocked. Sawtimber volume averages 647 board feet per acre; cordwood volume averages 4.5 cords per acre.

[15] The 1949 Census of Agriculture shows the annual sale value of timber products in northern Michigan to be less than $0.50 per acre of farm woodland. Farm woods run to larger tree sizes than forest held by other groups of private forest owners and include a larger percentage of the more valuable timber types. Moreover, the sale value is a gross figure. It refers to cut products as well as standing timber and does not recognize labor and other costs of production.

[16] Management costs which might be undertaken for future timber yields under a plan of sustained-yield management appear in a different light if property taxes should rise significantly before returns on forest-management decisions can be realized.

[17] Yoho, et al., *op. cit.*

[18] *Ibid.*

erty tax on forest properties. Its basic principle is the postponement of all taxes on growing timber until the timber is harvested. This postponement applies only to timber, since the land remains subject to an annual property tax. When timber is harvested, the amount of the yield tax is determined either by the amount or the value of the timber cut.[19]

Forest yield-tax laws have been enacted in many states[20] in an effort to counteract some of the disadvantages of the general property tax as it applies to forest properties. The purpose has not been so much to lessen the total burden of the property tax on the individual landowner (although in many cases total tax savings by landowners have resulted) as to shift the burden of the tax to the time the forest owner obtains income from which taxes could be paid. Advantages to the public were visualized mainly as: (1) lessening the pressures to overcut mature forests and to create extensive areas of tax-delinquent cut-over lands; and (2) stimulating landowners to undertake planting and the care of immature and mature timber needed to achieve permanence of operations (in short, sustained-yield forest management). Tax delinquency no longer appears to be a serious problem, but encouraging private landowners to adopt sustained-yield forestry remains a major problem of conservation.

In theory, a yield tax is considered neutral in its effects on conservation,[21] i.e., private landowners are not induced to shift their production, either toward the present or toward the future. There are some exceptions to the neutrality of a yield tax. For example, some operations needed to insure ultimate improvement of forests such as thinning operations in growing stands of timber and the removal of low-value trees at the time of harvest might be made uneconomical by the imposition of a yield tax. However, these are exceptions. They are not important enough to offer serious handicaps to forest conservation.

Woodlot Yield Tax

Michigan's first efforts to provide a forest yield tax were directed toward farm forestry. The Foster Act of 1911 attracted only a single listing before it was replaced by the Woodlot Act of 1917 (Act 86, P.A. 1917). The Woodlot Act still remains in force as an optional alternative to the general property tax.

Under the terms of the Woodlot Act, woodlands are assessed at not more than $1 per acre. The regular annual ad valorem general property tax rate applies to the assessed valuation. When the timber is harvested a yield tax is imposed at the rate of 5 percent of the stumpage value of the timber cut. Firewood or building material for domestic use is exempt from the yield tax.

To qualify for classification the land listed must be not over one-fourth of a tract not over 160 acres in size, of which at least half is improved and devoted to agriculture. Stocking of trees must attain specified standards; if not attained naturally, trees must be planted. Under the law, no woodland pasturing is permitted.

Application for listing must be made with the county treasurer who, in turn, notifies the local supervisor or other assessing officer. Before making a commercial harvest the landowner must notify the assessor and, after cutting, the owner must file a record of the volume

[19] For a good nationwide discussion of forest yield taxes, see Ralph W. Marquis, *Forest Yield Taxes*, United States Department of Agriculture Circular No. 899, Washington, D. C., 1952.

[20] Fourteen states have yield-tax laws, but in 11 of these states (including Michigan) the classification of forest land is optional. *See* United States Forest Service, *Timber Resource Review* (Preliminary), Chapter IV, Washington, D. C., 1955, p. 2.

[21] Ciriacy-Wantrup, *op. cit.*, p. 186.

and value of the timber cut. The timber cannot be removed until the yield tax is paid.

Commercial Forest Reserve Act

Michigan's forest yield-tax law dealing with commercial forest lands, commonly referred to as the Pearson Act, dates back to 1925 (Act 94, P.A. 1925). Listing forest lands under the provisions of this act, as in the case of the Woodlot Act, is optional with forest landowners.

Under the Pearson Act, forest lands may be withdrawn from the ad valorem tax rolls. The land owner is required to pay an annual property tax of 5 cents per acre.[22] When timber is cut, it is subject to a yield tax of 10 percent of its stumpage value if the property has been classified 9 years or longer. If a cut is made sooner than 9 years the yield tax is graduated on a lesser scale down to a 2-percent minimum.

The Pearson Act is aimed specifically at commercial forest properties. To qualify for listing, no portion of a property may be used for agriculture, mineral, grazing, industrial, recreational or resort purposes. The land has to be capable of growing commercial timber but it must not be overstocked with mature timber at the time of application. Tree stocking must be sufficient to show promise of developing a commercial stand at maturity. No restriction of public hunting or fishing on the property is permitted.

Certification of an application for listing is the responsibility of the Department of Conservation. Before cutting any timber on a listed property the landowner must obtain a permit from the Department. A bond deposit is required and, after cutting, the owner must file a record of the volume and value of the timber cut. The Department verifies the report, then collects the yield tax due.

[22] The state of Michigan contributes an additional 10 cents per acre per year to the local government.

Forest Land Classified Under the Yield Tax Law

Before noting the forest acreage which has been listed under Michigan's yield tax laws, it is appropriate to recognize that only a portion of the private forest properties qualifies for classification under the requirements of the laws.

In northern Michigan some 300,000 acres of farm woodland would qualify for listing under the Woodlot Act. This represents only 20 percent of the forest acreage owned by farmers and part-time farmers. The Pearson Act has broader application. Of 3.4 million acres of private forest held outside of farms about 2.5 million acres or 74 percent could qualify for listing without necessitating changes in land use.

Woodlot Yield Tax. Because no central state agency has effective responsibility for administering the Woodlot Act, no agency attempts to compile statewide statistics on classification under the Act.

The first study of the operation of the Act was undertaken in 1925.[23] At that time 1,580 acres of woodland in Michigan held by 55 owners were listed. By 1939 the total crept up to 2,538 acres in 72 holdings.[24] This represented an insignificant fraction of Michigan's 3.8 million acres of farm woods recorded by the Census in that year.

Since the Forest service study of 1939 no attempt to compile statistics on forest land classified under the Woodlot Act has been made. However, from inquiries at the Extension Forester's and State Forester's offices, it is clear that farmer interest in the Act has remained quiescent and additional listings have never comprised a substantial acreage.

[23] Karl Dressel, *Woodland Taxation in Michigan* (Unpublished Master of Science thesis), Michigan State University, East Lansing, 1926).

[24] A. Z. Nelson, *Forest Land Taxation in Michigan*, United States Forest Service, Washington, D. C. ,1940, p. 27.

Commercial Forest Reserve Yield Tax. Listings in Michigan under the Pearson Act rose steadily from 24,000 acres in 1926 to 145,000 acres in 1954, then jumped to 301,000 acres by June 30, 1956. The present listing still represents a small part of the total forest land eligible, but the recent upsurge in interest is noteworthy.

Most of the listed areas are parts of a few large corporate holdings in the Upper Peninsula. In the 31-county study area of the Lower Peninsula, where large corporate holdings are scarce, few forest areas have been listed under the Pearson Act. As a matter of fact, in most years withdrawals have exceeded new listings; and the acreage has declined from the initial listing of 8,500 acres in 1926 to 4,575 acres in 1956.

Owners' Attitudes Toward The Yield Tax Laws

The negligible use made of the yield-tax laws in northern Michigan raises questions of explanation. It has already been pointed out that 80 percent of the farm woodlands and 26 percent of the remaining private forests do not qualify for listing under either of the laws, but lack of qualification is not an adequate explanation for the small acreage of listings, particularly in respect to the Pearson Act.

Interviews held with forest landowners in northern Michigan who qualify for classification under the Pearson or Woodlot Acts provide some of the possible answers. These may be summarized broadly as follows:

Owners' Attitude	*Percent of Forest Area*
No knowledge of yield-tax law	72
Had knowledge of yield-tax law, but did not register because:	
Did not think property qualified	1
Did not believe tax benefits would be gained	6
Believed "red tape" and restrictions upon use outweighed possible tax benefits	11
Objection unclear	8
Registered forest land under yield-tax law	2
TOTAL	100

The dominating reason for the little use made of the yield-tax laws by qualifying landowners is lack of knowledge. Most forest landowners simply do not know of the existence of a yield-tax alternative to the general property tax. Publicity from state agencies or local tax officials about the acts is virtually nonexistent. Unless a landowner chances to learn of the yield-tax laws from an informed landowner or a professional forester, he is likely to remain uninformed.

According to the sample of owners interviewed, owners of 28 percent of the forest area which qualifies for classification under one or the other of the yield-tax laws had knowledge of the existence of the appropriate law; but only 2 percent of the area was registered uner the yield-tax laws.[25]

Outstanding among the reasons offered by landowners for not registering forest land was the attitude that "red tape" and restrictions upon land use outweighed any possible tax benefits. In evaluating this item, it must be recognized that many landowners, as a result of imperfect knowledge, exaggerate the various obstacles they face under yield-tax laws, but obstacles do exist. The procedures that must be followed—application for classification, inspection and approval, application for cutting permit, keeping of volume and value records of products harvested, posting of bond, prepayment of yield tax before timber removal—are a nuisance to landowners.

There is considerable fear that registration clouds an owner's title to the land. This is partly justified since a change in ownership does not automatically declassify a property. Many owners also fear that classification will subject them to close cutting restrictions. This is an

[25] Sampling error produced an excessively high estimate of registered forest acreage. The actual figure could be no more than a fraction of one percent.

erroneous impression, although the Woodlot Act does specify that good stocking of trees must be maintained.[26]

Other restrictions may give pause to landowners contemplating registration. The Woodlot Act permits no woodland pasturing. The Pearson Act states that no portion of a property may be used for agricultural, mineral, grazing, industrial, recreational or resort purposes; also, the property must be open to public hunting and fishing.

The red tape and various restrictions, fancied and real, which go along with registration, could easily discourage many landowners from listing eligible forest land under a yield-tax law. Possible tax benefits would have to be large to overcome such obstacles. This is particularly true in the thinking of owners who recognize that the attempt to seek a tax advantage might provoke ill-feeling locally.

Many landowners recognize that tax benefits to be gained are slight or simply do not exist. The average annual property tax on a farm woodlot is about 18 cents per acre. On a 40-acre woodlot (the maximum that can be considered under the Woodlot Act), the total tax would amount to $7.20. If classified under the Woodlot Act, a total saving of about $6 might be effected in the annual tax, but against this saving a farmer would have to compute a 5-percent yield tax on the value of commercial products harvested whenever products were cut. It is obvious that in the usual situation a farmer can gain little, if any, tax benefit from the Woodlot Act, particularly if he can foresee the possibility of a commercial harvest in the near future.

Under the Pearson Act, too, it can be demonstrated that frequently a tax advantage will not materialize. In comparison with the general property tax, which is a known quantity (at least for the present), the landowner can count on a fixed annual charge of 5 cents per acre. The fixed charge will usually represent a substantial tax-saving over the general property tax, but the 10-percent yield tax on the value of timber harvests can easily alter the comparative advantage. The yield tax is not likely to offer tax benefits in situations where the general property tax is low, where timber yields may be expected within a few years, and where timber values are high.[27]

Influence of Yield Taxes on Forestry

The meager use of the optional yield taxes available in Michigan, in itself, does not suggest any important influence on forestry in the 31-county study area. Not only is the acreage listed under the yield-tax laws negligible but none of the interviewed owners with registered acreage suggested that their forest management had in any way been influenced.

Forest landowners who have registered under a yield tax have done so to obtain a reduction in their tax burden. In individual cases the saving has been large, but it would be difficult to find instances in which the tax saving has been sufficient to induce a significant change in the quality of forest management.

[26] The requirement is specified in the Act, but no agency attempts to enforce the requirement.

[27] Dietz compared taxes under the general property system and under the Pearson Act in a number of hypothetical situations. (Warner Dietz, *A Study in Michigan Forest Land Taxation*, unpublished Master of Science thesis, Michigan State University, Department of Forestry, East Lansing, 1954). For example, assuming property taxes at 20 cents per acre on poor aspen type yielding 6 cords per acre at the time of harvest, listing under the Pearson Act would result in a tax saving provided the time of deferment until harvest would be at least 10 years. The amount of the saving would increase as the deferment interval increased. In a similar situation, but with property taxes at 10 cents per acre, a tax loss would be incurred by shifting to the yield tax unless a waiting period of at least 15 years until harvest was required. Again, assuming property taxes of 20 cents per acre on better aspen type yielding 15 cords per acre, listing under the yield tax would result in a tax loss if the harvest would occur within 10 years; but with a 15-to-20-year waiting period the tax advantage would shift to the yield tax.

A higher standard of forest management probably exists on listed properties than on unlisted properties, but the reason does not lie in tax benefits. It is the more informed owners who are interested in yield taxes—the same owners who are also more informed about the requirements of sustained-yield forestry. The superior knowledge is asserted in several directions. It has been observed in the Upper Peninsula, where most of the acreage listed under the Pearson Act occurs, that the listings are concentrated on a few large corporate holdings where land management is under the direction of professional foresters. These properties are already committed to sustained-yield forestry. Their listing under the yield tax is intended to increase the profitability of forest management, not to make it possible.

The situation could change if property taxes should continue to move upward as they have been doing in recent years. Conceivably, taxes could become sufficiently burdensome on properties committed to sustained-yield forestry to induce premature harvest or to discourage sustained-yield forestry altogether. This situation could develop providing, of course, that a suitable yield-tax alternative was not available.

The big advantage of the yield tax to the forest landowner is thus seen to be its insurance feature. For a variety of reasons the landowner does not wish to abandon the property tax. He may hold on to it even at a considerable tax disadvantage, but the disadvantage is held within reasonable bonds buy the yield-tax alternative. If the property tax becomes excessively burdensome, the landowner may shift to the yield tax. Knowledge of this alternative serves as a caution to tax assessors who are considering increases in forest-property assessments.

Summary

Forestry property taxes in northern Michigan currently average 18 cents per acre. The most common tax bracket is 10 to 14 cents per acre, and 89 percent of the forest is taxed at less than 25 cents per acre. Generally speaking, these taxes do not appear burdensome. Very few landowners interviewed indicated much concern over their present forest taxes and none of them suggested that their forest management decisions were influenced in any way by this item of cost.

Private timber management in the region is generally poor, but the reasons for this, as determined by sample interviews, lie outside the property tax.

Forest yield taxes have been devised to avoid the undesirable effects on forestry attributed to the general property tax. Two yield taxes—the Woodlot Act of 1917 and the Commercial Forest Reserve Act of 1925—are available as optional tax alternatives to forest landowners of Michigan.

Some 300,000 acres of farm woodland in northern Michigan could qualify for listing under the Woodlot Act. About 3.4 million acreas of private forest held outside of farms in northern Michigan could qualify for listing under the Commercial Forest Reserve Act. However, only a few thousand acres are listed under both of the yield-tax laws.

Foremost among the explanations for the little use made of the yield-tax laws is lack of knowledge of the existence of these laws. Most forest landowners simply do not know that they have an alternative to the general property tax. Those who know about yield taxes hold back from classification for these primary reasons: (1) the feeling that "red tape" and restrictions placed on land use outweigh any possible tax benefits; (2) the fear that classification clouds an owner's title to the land; and (3) the recognition

that tax benefits will not always be gained in comparison with the general property tax. The reasons may often be ill-founded, but they are quite real to the owners themselves.

On classified properties in northern Michigan, owners acknowledge little influence of yield taxes on the quality of their forest management. Classified properties are often committed to sustained-yield forestry before classification. Their listing under a yield tax is intended to increase the profitability of forest management.

Despite the little use made of the yield-tax alternative, many landowners feel it serves an important insurance function. Knowledge of the yield-tax alternative cautions assessors against increasing the general property tax to the point where it becomes an excessive cost burden on forest properties.

A Reexamination of Discriminatory Price Practices

By ROBERT L. WINESTONE* *and* ARTHUR A. WICHMANN**

CERTAIN natural monopolies (service industries usually characterized by decreasing average costs of production) are regulated by society. Such regulation is undertaken to provide service to the consumer at the lowest possible price consistent with the legal concept of a fair return on a fair investment. The requirement of equity is included in the regulatory statute for the purpose of providing that the service be continued and improved. Since the investment is permitted to earn a return as great as it could earn in its best alternative use, there are incentives for purchasers of service corporation securities to continue to provide funds.

Regulatory bodies, vested by statute with the function of establishing rates consistent with the two objectives, are almost immediately faced with the problem of price variations offered to different consumers and price variations between units of service to the same consumer. The members of the regulating agency must decide whether to accept these customary price differentials or to insist upon one-price service. Arguments favoring differentiated price structures fall into two major categories: one is termed a price differential for the sale of off-peak service; and the other, price discrimination for the purpose of increasing the size of plant permitting lower average cost of production to be obtained as a result of increased output.

With respect to the first argument, a price differential for the sale of off-peak service, the reasoning presented to the regulatory agency usually takes the following form: if the off-peak service is not sold, it will be wasted since the plant will probably not wear out at a faster rate when it operates than when it stands idle. The existing plant must have many hours of unused capacity to insure sufficient output for the relatively short periods of peak demand. Providing revenues from off-peak sales are greater than the marginal cost of delivering the service to the induced consumers, there will be a sum available which can be used to lower the price per unit of service to all regular consumers. This might be an acceptable technique for achieving lower cost per unit of sales if the regulatory agency has a formula acceptable to the courts for determining a fair return on a fair investment and if it could prevent the monopolist from padding his cost structure.[1] Since the problem of off-peak sales is not here considered as price discrimination, it remains outside the scope of the arguments developed in this paper.[2]

The problems arising out of the "lumpy" nature of plant size in expanding output are also outside the scope of this paper though it would seem that such discontinuities could only emphasize the conclusions drawn from the assumption of a continuous "envelope long-run average

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[1] *Munn* v. *Illinois* 94 US 113 (1877). In this case the courts upheld the right of the legislative branch of government to establish rates in certain businesses, those affected with the public interest. *Smyth* v. *Ames* 169 US 466 (1898). This case established the power of the courts to review every act of state rate regulation. The courts have said that a standard for determining valuation must include consideration of prudent investment, depreciated and original cost, replacement cost, the market value of stocks and bonds, and reproduction costs. No system of weighting these concepts in the standard, however, was ever established. When the Hope Natural Gas Company Case 320 US 591 (1944) was settled, the courts accepted actual cost as the basis for valuation.

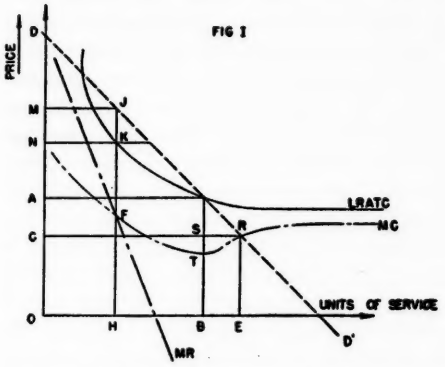
[2] It might well be the basis for a subsequent study.

total cost curve" (LRATC).[3] There is also implicit in any analysis of benefits obtained from discriminatory price practices that not only will the favored consumers benefit, but also the non-favored consumers will somehow benefit from the lowered costs presumably in the form of lower rates.[4] It is further argued that if the consumer knows the consequences of his demand decisions, the "marginal social value" is represented by the average revenue curve and that the "marginal social cost" is equal to the value of alternate products that must be sacrificed to obtain an additional unit of the service under consideration. If the entire cost of an extra unit of out-put is borne by the individual firm then the firm's marginal cost is the marginal social cost, since the price paid by a firm to the resource owners to obtain the extra output is determined by the alternative uses for that resource.

Any move in the direction of equating marginal social cost with marginal social value will improve the welfare of the community if it is presumed that the benefits somehow will accrue to the community. This concept may be illustrated graphically as in Figure I.

The natural monopoly will maximize profits, if unrestricted by the community, by producing an output of OH at a price per unit of OM. Maximum monopoly profits are then equal to the area MJKN. In this example, it is obvious that the marginal social cost of the OH^{th} unit is

FIG I



HF, yet the marginal social value is OM. Therefore, social welfare can be enhanced by greater output so long as marginal social cost does not exceed marginal social value.[5]

Most regulatory bodies take the position that price shall be established at the intersection of the average revenue (DD) and average cost curves, that is to say, average cost pricing is followed.[6] In Figure I, such a decision would establish the output at OB with a price OA. One of the justifications for average cost pricing, in addition to the fact that such pricing simplifies the regulatory process by not requiring computations of difficult concepts, is that the output OB at a price OA would result from a competitive model. This would be true if in the competitive situation the demand schedule (DD) is the industry demand schedule and the LRATC is the industry supply schedule based upon the low points of the atomistic sized firm's average total costs. The LRATC declines

[3] John E. Due, *Intermediate Economic Analysis* (Chicago: Richard D. Irwin, Inc., 1950), p. 237.

[4] There may be certain tertiary benefits accruing to the consumer in the form of increased national output. See: A. C. Pigou, *The Economics of Welfare* (London- Macmillan and Co. Ltd., Fourth Edition, 1946), p. 284. An increase in national income, however, is at best only a poor measure of social welfare. To assume that these tertiary benefits will trickle down to the mass of consumers is to assume a greater degree of competition in the economy than in fact is justified by any examination of income distribution patterns. See, for example, John Williams, "Free Enterprise and Full Employment," *Financing American Prosperity* (New York: Twentieth Century Fund, 1945), p. 377. In a similar connection Williams says, "we are not sure whether the tax (on corporations) absorbs funds which would otherwise go into higher wages or lower prices." If neither lower prices nor higher wages would result from increased output, what will be the teritiary effects of discriminatory price practices?

[5] A. C. Pigou, *op. cit.*, pp. 223-224. Pigou feels that the optimum output is obtained only if marginal cost is equal to demand. A purely competitive industry which exhibits decreasing supply cost does not by this definition achieve optimum output.

[6] Emery Troxel, *Economics of Public Utilities* (New York: Rinehart and Company, Inc., 1947), p. 442.

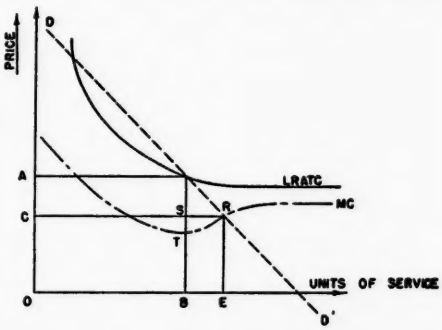
because external economies outweigh external and internal diseconomies. Decisions are made at the firm level and there the firm's marginal cost is equal to its average revenue.

It has been suggested that advantages in social welfare can be obtained by increasing production beyond the level of output indicated as appropriate by a regulatory policy of average cost pricing. Following this suggestion, social welfare would be maximized given the conditions found in Figure I at an output OE and a price per unit of OC. However, the price per unit OC is now less than the long-run average total cost per unit. In an endeavor to obtain an output, consistent with the postulated maximum social welfare, the regulatory body may employ either of two techniques:

(1) it can tax and subsidize the natural monopolist to compensate him for the enforced losses, resulting from their rate decision, in which case the consumers of this service are being subsidized by the taxpayers[7] or, (2) it can permit price discrimination, holding price at OA for non-favored consumers and establishing a lower price to induce other consumers to purchase a quantity BE. The natural monopolist will now be operating at an output of OE with the marginal social cost approaching equality with the marginal social value.[8]

Assuming that the regulatory agency has succeeded in securing an output of OE, the question arises, will benefits accrue to the non-favored consumers of this service? The answer to this question hinges upon the magnitude of what is here called the producer's surplus. The producer's surplus is the area STR in Figures I and II.[9] At this point it should be observed that in the case of a discriminating natural monopoly there will be a producer's surplus resulting from

FIG. II



the sale of output at the lower discriminatory price only if the marginal cost curve is rising at its point of intersection with the demand curve (DD). If the marginal cost curve is rising at its intersection with the demand curve, the area of the producer's surplus triangle will probably be small relative to the total number of non-favored consumers. Moreover, the triangle STR exceeds the amount of producer's surplus which could actually be used to benefit non-favored consumers for in order to sell BE units to the favored consumers a price lower than OC must be set by the monopolist. As price is reduced from OC the area of producer's surplus tends to disappear entirely. Thus, the producer's surplus divided among OB units of output would mean an infinitesimal price reduction if there were any at all.

[7] A. C. Pigou, "Some Aspects of Welfare Economics," *American Economic Review*, June 1951, pp. 291-293. It is questionable whether there is any net gain to the community since there is no way of measuring the loss to the taxpayers compared to the gains by the consumers.

[8] A problem is presented in this instance because the demand situation illustrated in Figures I and II is the quantity all consumers will wish to buy at the low price of OC. Therefore, the price of this service would have to be below OC to induce a group less than the whole community to consume the additional quantity BE (BE being the additional quantity that the whole community would wish to buy if the price were decreased from OA to OC.)

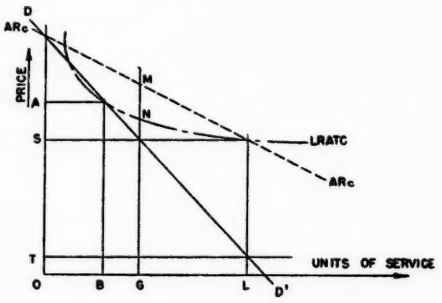
[9] The area BTRE in Figure II represents the total cost of BE units of output, while the area BSRE represents the total revenue from the sale of BE units of output assuming a price per unit of OC.

At this point it should be noted that, with a decreasing LRATC curve, marginal cost may be decreasing, constant, or increasing. The only mathematical requirement is that the marginal cost curve be below the average cost curve.[10] If marginal cost is constant at the point of intersection with the demand curve there will be no surplus to divide among non-favored consumers, and it would be virtually impossible to sell BE units of output to the few favored consumers.[11] Finally, if marginal cost is decreasing at the point of intersection with the demand curve and, if price is set at OC, the discrimination will not produce a surplus but a loss. Certainly at the price OC, the additional quantity BE could not be sold.

Therefore, it is questionable whether any pricing policy other than average cost pricing is desirable in a natural monopoly because, first, there is no possibility of measuring the social gains against the social losses in the tax and subsidy program,[12] and, second, it is doubtful whether the output OE can even be obtained by discrimination.

If partial and personal discrimination does not provide a technique for obtaining an output which is consistent with the proposal that marginal social cost equal marginal social value, will not complete discrimination provide such an output? Figure III has been constructed to permit an analysis of the case of complete discrimination. The demand schedule (DD) becomes the monopolist's marginal revenue schedule since it now indicates to the monopolist the additions to total revenue resulting from additional sales of the service.

FIG. III



If the regulatory agency permits completely discriminatory pricing in the hope that the additional purchases of the service will lower costs substantially, the average revenue schedule facing the monopolist will necessarily be above the demand schedule.[13] The newly constructed average revenue curve facing the monopolist will intersect the LRATC at an output considerably to the right of the average cost single price output OB at price OA, but the equilibrium is unstable. The establishment of OS as the minimum price permitted consumers, means that

[10] Average cost (AC), and marginal cost (MC) are derived from total cost (TC). Thus if $TC = Kx - x^3$, $AC = K - x^2$ and $MC = K - 3x^2$; in which case average cost has a negative slope and marginal cost is negatively inclined throughout its relevant length. If $TC = K + Cx$, then $AC = \frac{K}{x} + C$ and $MC = C$. Thus, though average cost is declining, marginal cost is constant. Finally, if $TC = Kx + \frac{1}{x}$ then $AC = K + \frac{1}{x^2}$, and $MC = K - \frac{1}{x^2}$. In this last case, then, though average cost is declining, the marginal cost curve rises throughout its relevant length.

[11] Committee on Price Determination, *Cost Behavior and Price Policy* (New York: National Bureau of Economic Research, 1943), pp. 248-250. This Committee found that the marginal cost curve over long stretches of its length is probably flat and that it then rises abruptly to cut the low point of the average cost curve.

[12] M. Reder, *Studies in the Theory of Welfare Economics* (New York: Columbia University Press, 1947), pp. 64-67. The new welfare economics insists that social gain from public policy can take place only if no one is injured at the same time that the policy is aiding certain individuals.

[13] Since the demand schedule becomes the marginal curve facing the monopolist, assuming that he is permitted complete discrimination, the average revenue schedule will take the form of $AR_c = \frac{MR}{1 + \frac{1}{\eta}}$ where AR_c is the constructed average revenue schedule, MR is the given demand schedule, and η is the point elasticity of demand. In the more general case, let x be the output; y the total revenue, a f (x); y/x the average revenue, a f (x); and dy/dx the marginal revenue, a f' (x). Average revenue may now be found by performing the following integration: $\frac{\int f'(x)\,dx}{x}$

the quantity demanded would be OG although OL would be the output at which average cost would be OS.

To reach a point at which the community would derive any benefit at all would require that OG be at least twice the distance OB; otherwise the consumers would not only be spending a greater total amount for the service but also the average outlay per unit of service for each consumer would be greater than in the single price market.

At price OS the monopolist would be showing abnormal profits of NM per unit of service. These profits would have to be recaptured and the consumers of the service would be subsidizing the taxpayers. In this instance it would not be possible to weigh the gains against the losses.[14] To force the monopolist to operate at an output of OL, at which point only normal returns would be earned, would require a terminal price OT. Such a price would force marginal social value substantially below marginal social cost.

It would also be difficult to induce the consumers of the service to purchase OL output for another reason. Ordinarily a demand schedule is derived for a single price market. In the present case, however, with price discrimination there would be income effects which will shift the entire demand schedule to the left.

There is, then, no reason to assume that, except for mere chance, the unstable equilibrium developed in the case of complete discrimination would either provide a general equilibrium, or that the output of this service would equate marginal social cost with marginal social value.

The analysis in this paper has raised serious ethical and theoretical doubts as to the validity of permissive price discrimination by natural monopolies between consumers or between units of service to a single consumer. The simple solution, price discrimination, has been accepted uncritically for too long a time as a tool for improving social welfare. The analysis suggests that neither complete nor partial discrimination will improve the welfare conditions of consumers of the service of a natural monopoly beyond that obtained under a policy of average cost pricing.[15] If the analysis presented in this paper is valid, a critical reappraisal of the case for "desirable discrimination"[16] seems warranted.

[14] E. J. Mishan, "The Principles of Compensation Reconsidered," *Journal of Political Economy*, August 1952, p. 313. (The Hicks-Kaldor criterion states that an improvement in welfare results if the new economic position is such that those who gain by the movement can more than fully compensate those who lose by it.) It makes no difference whether the gainers actually compensate the losers or not in measuring a welfare gain. See also I. M. D. Little, *A Critique of Welfare Economics* (Oxford: Clarendon Press, 1950), p. 105. "An Economic change is desirable if it does not cause a bad redistribution of income and if the potential losers could not profitably bribe the potential gainers to oppose it."

[15] Attention is again called to the fact that consideration of price discrimination based upon the "off-peak load" concept has not been included in this study.

[16] George J. Stigler, *The Theory of Price* (New York: The Macmillan Company, Revised Edition, 1953), pp. 218-220. Stigler uses this term to describe discriminatory price practices which may persuade natural monopolies to produce optimum output.

The New Jersey Turnpike

By JOHN J. GEORGE* *and* THOMAS W. RYLEY**

NEW JERSEY for several years had a severe traffic problem. Situated as it is between New York City and Philadelphia, traffic in and out of both major cities clogged New Jersey streets and caused difficulties for New Jersey residents. New Jersey highways bore the brunt of Florida winter vacationists and the summer rush to the shore.

One of the major fears about this situation that concerned New Jersey officials was the flow of industrial and agricultural produce, without which New Jersey would lose revenue. The withering of shore resorts also bothered them. It was partly due to these fears that the Governor recommended January 21, 1947, the construction of a state program of freeways and parkways. He related much of his discussion on the subject to financing, for this was to be one of the most important features of the project. The constitution forbade creation of a state debt in excess of 1 percent of the income, and a highway program that would have filled all needs such as this would surely run in excess of that amount.[1]

The resultant legislation got around this by designating the Authority to administer the new turnpike as a private corporation and specifying that any debt incurred by it was not a debt of the state.[2] Money was to be raised by the selling of revenue bonds and paid for by tolls.[3]

The measure was passed on October 27, 1948. At this time the Governor also designated the Authority to undertake the initial project.[4] Almost immediately the problem of the public-private status of the Authority arose. On September 8, 1949, the Authority asked for a declaratory judgment on its status, with particular reference to the financial powers, asking if this truly constituted a debt of the state.[5] The Superior Court ruling declared that, because of the private character of the Authority, no state debt was created according to the New Jersey Constitution of 1947, Act 8, Section 2, Paragraph 3. The Authority was a separate corporate entity.[6] This ruling was later to be used as a challenge to other acts of the Authority; it required further judicial interpretation to enable the turnpike to be completed, but this decision sufficed to get the project underway.

It is with respect to the public-private aspect of the Turnpike that the emphasis in this article is concerned. To what extent is the Turnpike a private corporation and how does it qualify as a public concern? Or does its status lie some where between?

Legislation

The Commission. The New Jersey Turnpike Authority consists of three members appointed by the governor and approved by the senate. The appointments are for five years. Vacancies occurring are filled for the remainder of the unexpired term. The sole requirements for eligibility are residence in the state and status as an elector for one year preceding appointment. There is no geographic requirement such as is found

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[1] *Report of the New Jersey Turnpike Authority, 1949*, p. 7. Hereafter referred to as N.J.T.A. plus the year.

[2] *Laws of New Jersey, 1948*, C. 454, p. 1864. Hereafter referred to as N.J.L.

[3] *Id.*

[4] *The New York Times*, October 28, 1948, p. 58.

[5] *Ibid.*, September 8, 1949, p. 48.

[6] *New Jersey Turnpike Authority* vs. *Parsons*, 5 N. J. Super 595; and 3 N. J. Supreme Court 235.

in many state authorities and bi-state agencies.[7]

On February 14, 1949, the Governor designated three members of the Authority and a month later a chairman was appointed,[8] the law leaving it to the governor to designate the holder of that office.[9]

The Authority is empowered to adopt bylaws for the regulation of its affairs and to conduct the business of the turnpike. In addition, the law permits it to: sue and be sued in its own name; construct, maintain, and repair projects that are authorized by law; fix, collect, revise, and charge tolls; establish any rules and regulations deemed proper for the use of any of the projects; acquire, hold and dispose of real and personal property; and make any contracts deemed necessary for any aspect of the project.[10]

A legislative act of 1950 authorized it to acquire by eminent domain any property deemed necessary for any aspect of turnpike construction. This act also permitted it to appoint additional officers and to create any posts which may be required by expanding operations.[11]

None of the regulations made by the commission are binding until they have been filed with the Secretary of State and the filing has been duly certified by the Secretary of the Authority.[12] Thus, even in the sphere of the exclusive powers granted to the Authority, the state maintains a perfunctory check on its activities. A further check is the requirement that the Authority must submit to the Governor on or before January thirtieth each year a report on its activities of the preceding year. This report is not an innovation in authorities; it is characteristic of the public-private entity of the Authority. An audit of its books is also made at the end of each year and the cost of the audit is charged to the Authority.[13] The meeting time of the commissioners is not set by law. They are required only to maintain offices in the state for the purposes of frequent conferences.[14]

Thus, the Authority has a wide latitude in its operations although certain restraints are placed on it, namely the annual report, the filing of regulations, and the appointment of members by the governor with the advice and consent of the Senate. These factors serve to deny the completely private aspect of the Turnpike Authority and emphasize the public-private aspect of it. Other manifestations of the public-private relations will be seen as some of the various powers of the Authority are discussed.

Eminent Domain. Early in 1950 the Authority encountered a serious obstacle at the city of Elizabeth. The engineers had proposed a route through a section of the city which would have required dispossessing a large number of families. The city and its residents objected and their representative attempted to put through a measure that would have forced the Authority to avoid the route through Elizabeth. This change of plans would have cost the Authority an additional $20,000,000.[15] It was unsuccessful. The Senate passed, 16 to 5, a measure giving the power of eminent domain to the Authority. One of the dissenters was Senator Robert Meyner, later to become governor and supporter of the Turnpike.[16] The House also voted, 44 to 16, to give the Authority this

[7] N.J.L. 1948, c. 454, p. 1878, as amended N. J. L. 1952, c. 35, p. 125.
[8] N.J.T.A. 1949, p. 7.
[9] *Ibid.*, 1948, p. 7.
[10] N.J.L. 1948, c. 459, p. 1860.
[11] *Ibid.*, 1950, c. 1, p. 17.
[12] *Ibid.*, 1951, c. 264, p. 916.
[13] *Ibid.*, 1948, c. 454, p. 1870.
[14] *Id.*
[15] *The New York Times*, January 22, 1950, p. 35.
[16] *Ibid.*, January 24, 1950, p. 21.

power.[17] The legislation permits the Authority to acquire, by purchase or eminent domain, any land or property deemed necessary for any project, for relocation of highways or of feeder roads.

A major test case arose which involved the power of the Authority to exercise eminent domain. Newark sought to enjoin the construction of a route through the east section of the city. The municipality protested that the route was unnecessary and would ruin that section of the city. They asked that the power of eminent domain, exercised by the Authority, be declared an unconstitutional delegation of the legislative power.

In a lengthy opinion, the Chief Justice summarized the opinion of the State Supreme Court. He reasoned that the Authority was a private corporation, thus carrying out the mandate of an earlier decision, but that, in carrying out legitimate governmental functions, it gained the power to exercise eminent domain. Since the legislature had endowed it with that power and no evidence of fraud existed, there was no invalid delegation of the legislative power.[18]

The Authority, in addition to the powers of moving on lands needed for construction, may enter upon lands adjacent to it for any activities deemed necessary for construction of the Turnpike. This action does not constitute a trespass and all damages are paid by the Authority.[19]

Displacement of Utilities. In order to be able to fulfill many of the requirements of the project the Turnpike had to be built near many towns. Thus, legislation was passed to the effect that the Authority had the power to maintain and to make reasonable regulations for the installation, construction, maintenance, repair, renewal, relocation, and removal of tracks, pipes, water mains, conduits, and telephone poles located in any area affected by it.

The legislation further required the utility to cooperate with the Authority, provided that it (the Authority) pay for any damages and for any expense incurred. In addition, the utility must be given an opportunity to relocate such projects.[20] To forestall any unnecessary trouble, a special division inside the Authority was set up to deal with the problem of utilities. All agreements to be made would require approval by the commissioners.

Feeder Roads. A turnpike requires many entrances to and exits from other roads; these are called "feeder roads." They are so designated when, in the opinion of the Authority, they become necessary to facilitate access to or egress from the project.[21] The Authority had been granted the power to designate avenues of ingress and egress and subsequent legislation served to implement it.[22] The Authority may take over any road deemed necessary for the purpose of constructing it so as to provide a feeder to the Turnpike. The consent of local authorities must be obtained before work can begin.

Rule Making. The Authority was given full power to make any and all regulations governing the conduct of persons using Turnpike facilities provided that these regulations did not conflict with state law. State laws are in effect on the Turnpike. The Authority is empowered to make, adopt, and promulgate any regulation that it deems necessary to manage the project properly.[23] Enforcement is obtained through the state police. Offenses are

[17] *Ibid.*, January 30, 1950, p. 30.
[18] *City of Newark* vs. *New Jersey Turnpike Authority*, 7 N. J. Supreme Court 377.
[19] N.J.L. 1948, c. 454, p. 1862.
[20] *Id.*
[21] N.J.L. 1949, c. 40, p. 119.
[22] *Ibid.*, 1948, c. 454, p. 1862.
[23] *Ibid.*, 1951, c. 269, p. 816.

punishable in the jurisdiction of the county in which the violation occurs.[24] The money received as fines accrues to the state with costs being awarded to the municipality.[25]

Legislation and Construction. The original route of the Turnpike was authorized by legislation early in 1949. The scheduled route was to begin at the New York State line, north of Alpine, and move in a southerly direction through the counties of Bergen, Hudson, Passaic, Essex, and Union to Middlesex. From this point it would go in a southwesterly direction through Monmouth, Mercer, Burlington, Camden, Gloucester, and on into Salem to connect with a proposed new bridge at the Delaware River.[26]

The initial Turnpike act rests on a fact and a proposition. First, the Turnpike runs close to the many large industrial centers of North Jersey, thus siphoning much traffic off the clogged city thoroughfares. The second concerns the proposed bridge over the Delaware River. This was to require additional legislation two years later to permit its building. It required the repeal of an ancient statute, prohibiting the building of additional bridges across the Delaware within certain distances from existing structures.[27]

In 1950, recognizing further the great increase of traffic along the Turnpike headed for New York,[28] the legislature authorized a spur, to be built from the main line of the Turnpike at route 6 to the George Washington Bridge.[29] In 1951, the Turnpike was authorized to construct even more projects as the need for additions became apparent. One was a spur to cut across Bergen County so that it might connect with the New York Thruway.[30] The legislature also provided for a spur across Newark Bay into Hudson County as a further aid to commuters.[31]

In the south, the prohibition on bridge building across the Delaware River was repealed by legislation whereby the Turnpike Authority was authorized to construct a bridge of its own. Additional legislation was enacted to extend the Turnpike from a point near Bordentown southward to the site of the proposed bridge. The construction of the bridge itself would be shared by New Jersey and Pennsylvania.[32]

In 1952 the Authority was authorized to build a spur across the state from a point in Essex County, on the Turnpike, westward to Morris County. At that point, it would cross the Delaware and connect with Pennsylvania's highway system.[33]

On August 19, 1955 plans were announced for a new $100,000,000 project to link the Turnpike with the Holland Tunnel. Work would begin in October 1955. This project would include a high level bridge over Newark Bay, connecting Bayonne and Port Newark.[34]

Financing. The New Jersey Turnpike Authority is not required to pay taxes or assessments on Turnpike projects or on any property acquired by it.[35] However, this tax exemption applies only to land that is actually used by the Authority in construction and does not include land purchased adjacent to it.[36] This constitutes a further example of the public character of the Turnpike. Still another example is the pledge by the state to the holders of Authority bonds that it will do

[24] *Id.*
[25] N.J.T.A. 1953, p. 37.
[26] N.J.L. 1949, c. 41, p. 121.
[27] N.J.T.A. 1952, p. 57.
[28] *Ibid.*, 1953, p. 17.
[29] N.J.L. 1950, c. 2., p. 23.
[30] *Ibid.*, 1951, c. 286, p. 1030.
[31] *Ibid.*, p. 1031.
[32] *Ibid.*, pp. 1031-1032.
[33] *Ibid.*, 1952, c. 334, p. 1073.
[34] *The New York Times*, August 22, 1955, Section II, p. 27.
[35] N.J.L. 1948, c. 454, p. 1869.
[36] *New Jersey Turnpike Authority* vs. *Washington Township* (Mercer) 16 N.J. Supreme Ct. 38.

nothing to restrict the rights vested by the initial act and subsequent legislation with reference to means of producing revenue.[37]

Money for the Turnpike comes from two major sources: revenues and tolls. The Authority is authorized to provide at any time it so chooses, by resolution, for the issuance of bonds to raise revenues to pay for construction or other activities. These bonds are refundable solely from tolls and subsequent bond issues.[38] The Authority determines the form of the bonds, including the interest rate and the denominations, and indicates the times and places where payments will be made on them.[39]

Turnpike bonds issued under provision of this act do not constitute a debt or liability of the state or any subdivision thereof. It is not a pledge of the faith, credit, or taxing power of the state.[40] This concept was sustained in the decision declaring the Authority to be a legitimate private enterprise.[41] The Authority provides for the issuance of additional bonds for new projects as approved.[42] Many new projects have recently been financed by additional bond issues. The legislation does not provide for the manner of selling the bonds. It does not specify whether the bonds should be sold privately or publicly. This matter has caused great concern among many people and was the principal cause for the opposition to the initial act. Those individuals felt that there would be a monopoly of the state highway facilities by an outside concern.[43]

Tolls are the major form of income. The Authority is empowered to fix, revise, and to collect them from any individuals using any of the facilities. The tolls are not subject to revision by any agency of the state.[44] The battle over toll rates was one of the Authority's biggest problems, with many of the critics of the system of collection ignorant of the state's inability to regulate the matter.[45]

When all of the bonds issued to finance the various projects have been paid off, the tolls will be eliminated. However, all projects must be in a good state of repair, and the Authority has the right to charge tolls at some future date, should subsequent projects or repairs be called for.[46] It is not likely that the tolls will be removed for some time because the Turnpike needs improvements and must keep up with the latest safety devices.

Operations

Facilities. Tolls are one of the most important aspects of this highway project. The New Jersey Turnpike installed super safeguards on their tolls as $8,000,000 annually was expected from motorists. First, the treadles were located in the pavement so that no car could pass by without being recorded. The treadle would indicate the number of axles which would pass over it and dividing by two would determine the number of vehicles which had gone through a particular toll station. Provision would be made for trucks with more than two axles.

A ticket time stamp in the toll booth records the time of the entrance and the exit of each vehicle. This is not only a clear indication of the amount of money to be charged a motorist, but a method of detecting the speeders whom the police cannot detect.

[37] N.J.L. 1948, c. 454, p. 1864.
[38] *Ibid.*
[39] *Ibid.*, 1948, c. 454, p. 1867.
[40] *Ibid.*, 1950, c. 1, p. 2.
[41] *New Jersey Turnpike Authority* v. *Parsons*, 5 N. J. Super 595.
[42] N.J.L. 1948, c. 454, p. 1871.
[43] *The New York Times*, March, 20, 1952, p. 20.
[44] N.J.L. 1948, c. 454, p. 1867.
[45] *The New York Times*, October 10, 1951, p. 19, and October 14, 1951, p. 85.
[46] N.J.L. 1948, c. 459, p, 1867.

An automatic device located in a utility building adjacent to the toll booths, but inaccessible to the collectors, records the number of axles and the number of transactions as reflected by the ticket time stamps.[47]

The toll rates have been the subject of much controversy. The full trip along the maintrunk of the Turnpike costs $1.75, although the intermediate rates add up to $2.00. For two-axle trucks, $3.10 is required for the full trip, while three-axle trucks pay $4.00 and semi-trailer trucks are charged $4.50 for the entire route. The intermediate rates are proportionately higher.[48]

The argument over toll rates centers around the matter of geography. South of Route 4, a distance of 90 miles the approximate rate is 1.1 cent per mile, a figure which corresponds quite closely with that of the Pennsylvania Turnpike. North of this point, for about twenty-eight miles, or the remainder of the highway, it is 3.5 cents per mile. This is due to the fact that more traffic, particularly that of the commuter variety, flows over that part of the Turnpike. Proportionately, the northern section receives more traffic.[49]

The cry of protest that accompanied the announcement of the toll rates was strongest in the northern counties. The Automobile Association of America (New Jersey branch) proposed that the rates be made uniform and that the extra revenue that would have been received, under this proposal, be compensated for by the Turnpike *taking the gasoline tax* from the filling stations located north of Route 4, between Elizabeth and the George Washington Bridge. The chairman of the group feared that the exorbitant rates would discourage Turnpike traffic and would increase he load on the already overcrowded North Jersey streets.[50]

The spectre of politics was seen in the argument over tolls. Carl Holderman, at that time the President of the C.I.O. in New Jersey, soon Secretary of Labor, charged that political favoritism on the part of the Turnpike officials had resulted in the northern counties and their residents paying a higher per centage of the revenues of the highway than those in the southern counties. Holderman pointed to the Pennsylvania Turnpike, which had a uniform rate of 1 cent per mile and had operated on that principle since its construction.[51] To this Paul Troast, President of the Authority offered an instant rejoinder. The rates were fair, he said, and had come about after long consultation with officials and planning engineers. Furthermore, comparison with the Pennsylvania Turnpike was unfair, since it had been built in 1939, when construction costs were cheaper.[52] Appeals to the state were useless as it could not enter into the matter. The legislative enactment had given the Turnpike Authority the right to fix tolls. The Turnpike remained adamant, and the controversy died down.

Safety Devices. One of the most important features of any highway construction are the provisions for safety. No parkway or thruway can completely eliminate accidents, since no engineer can eliminate the element of human error from driving, but the New Jersey Turnpike has done an admirable job of keeping down the accident rate.

The low incidence of accidents was no doubt due to the efficient policing of the Turnpike and its safety measures. The Turnpike has always had an interest in safety procedures and has kept abreast of the times in bringing the newest and

[47] N.J.T.A. 1951, pp. 45-47.
[48] *Ibid.*, 1949, p. 10.
[49] *Id.*
[50] *The New York Times*, October 14, 1950, p. 85.
[51] *Ibid.*, October 10, 1950, p. 14.
[52] *Id.*

best methods of accident prevention to the Turnpike. They have taken the opportunity to learn the latest techniques in turnpike safety by sending, in 1954, a representative to the Inter-Turnpike Committee.[53] One wonders if this conference might not be the prelude to a uniform set of traffic regulations for the continuous highway stretching from New York to Chicago.

The major safety features of the New Jersey Turnpike include a 12-foot travel lane with 10-foot finished shoulders to provide room for cars travelling laterally, a "skid proof" pavement, which reduces the hazards of rainy day driving, a complete drainage system in the center of the highway to facilitate the elimination of water, and to aid in night driving a 6-inch wide reflectorized stripe on the lanes and the inner edges of the Turnpike for its entire 118 miles.

The speed limit on the Turnpike was set at 60 miles per hour, although the "design" speed, the rate at which the road was designed with reference to mileage, was higher. It was 75 miles per hour below New Brunswick and 75 miles per hour above, the lower rate being caused by the greater industrialization in the northern part of the state.[54] The lowered speed limit was caused by the volume of traffic in the early days of the Turnpike operation which was 51 percent over that which was expected.[55] Forty thousand vehicles appeared, compared with the twenty-three thousand perdicted for the first month.[56] The lowered speed limit was only one of the factors that kept the accident rate low. One of the major traffic hazards, the billboard, was kept off the Turnpike by a "gentlemen's agreement.[57] Speed on the Turnpike is not fixed as it is on most roads. It can be lowered if weather conditions such as fog or ice warrant it. Neon light flashers have been installed over the regular speed limit signs, which can be lit from a central point, lowering the limit.[58]

Personnel. The Turnpike is manned by the New Jersey State Police who are charged with guarding and maintaining law and order on the road. Originally, the Turnpike force was composed of thirty-eight troopers, under the direction of a lieutenant, who in turn, was responsible to the Superintendent of the New Jersey State Police. In 1953, the detachment was raised to seventy-seven police officers, thus assuring the Turnpike of a normal patrol of thirteen men on duty at all times, or, one policeman per nine miles of highway.[59]

In the matter of police protection we find evidence of the Turnpike's public-private character. The officers are directly responsible to the State Police Superintendent, and are selected through the usual procedures. They are assigned to Turnpike duty in much the same way as they might be assigned to another position. However, the Authority compensates the state for their salaries and equipment, and even pays a proportionate amount to cover the cost of their training.[60]

Since the Turnpike Authority is not a public corporation, other employees cannot be under Civil Service. The employees are hired through the same process as would be employees of a private concern.[61] This presents a problem as far as the right to organize and strike is concerned. The New Jersey Constitution provides for the right of employees of private firms to organize,

[53] *Ibid.*, 1954, p. 26.
[54] *The New York Times*, November 4, 1955, Section II, p. 17.
[55] N.J.T.A. 1951, pp,. 7-8.
[56] *The New York Times*, October 21, 1952, p. 31.
[57] *Ibid.*, January 25, 1953, p. 17.
[58] *Ibid.*, December 1, 1951, p. 15.
[59] *Ibid.*, 1953, p. 35.
[60] *Id.*
[61] Interview with Mr. George Tapper, Institute of Management and Labor Relations, Rutgers University.

bargain, and strike, while public employees may organize and bargain. There is no prohibition to a strike of public employees, but neither is there permission.[62] The chaos that would result from a strike of toll takers would be serious. The Authority would like to find some way of putting the Turnpike in the category of a public project, solely for the purpose of eliminating strikes, but so far, it has not been successful.[63]

The one strike threat that the Turnpike faced was called off. It was in July of 1955, when Local 1511, CIO Government and Civil Employees, threatened a walkout of their members, both toll takers and maintenance men, if they did not receive a pay raise, commensurate with that received by an AFL union, representing another group of Turnpike employees.[64]

The problem is complicated by the fact that there is no method that can compel the selection of a single bargaining agent. Of the 220 toll takers, no one group can claim a majority. In addition to bargaining with the big unions, the Authority must cope with splinter organizations as well.[65]

Progress of Construction. While the Turnpike officials watched the first spades of earth fly, signalling the commencement of the project in 1949, they predicted that within twenty-one and one-half months the construction would be finished.[66] It took twenty-three months to finish the road but commissioners could hardly have foreseen the Korean War and the shortage of materials which they blame for the delay. By the time the initial strip had been completed, save for the final nine-mile link to the George Washington Bridge, 240 bridges and other structures had been built, eight million dollars had been spent in relocating utilities, and the Authority had acquired title to over 3,558 pieces of real estate.[67]

However, the Turnpike was hardly ready for complete use. Two sections were opened at this time, the 53-mile section from the Delaware Bridge to Bordentown, and the 40-mile strip from Bordentown to Woodbridge. The 12-mile strip from Woodbridge to Raymond Boulevard was not completed until a few days later. The final section from Raymond Boulevard to the George Washington Bridge was not completed until January 15, 1952. The official explanation was the delay in delivery of strategic materials necessary to construction.[68]

The legislature in 1952 authorized the Newark Bay-Hudson County extension and was completed in the spring of 1956.[69]

The linkup with the Pennsylvania Turnpike across the Delaware River was begun in June of 1954. The bridge which would connect the two states was made a joint project, with both turnpike authorities sharing in the cost.[70]

Engineering reports indicated that it was a matter of expediency that the bridge connecting the two Turnpikes be built within a close proximity to the Burlington-Bristol Bridge. It was therefore necessary for an additional act to be passed by the New Jersey legislature, repealing the act prohibiting bridge building in the area.[71] As soon as it was passed, the engineers resumed work

[62] *New Jersey Constitution*, Article 1, Paragraph 19.
[63] Tapper, interview.
[64] New Brunswick *Daily Home News*, July 1, 1955, pp. 1, 16.
[65] Tapper, interview.
[66] *The New York Times*, September 21, 1949, p. 36.
[67] N.J.T.A. 1951, p. 7.
[68] *Ibid.*, pp. 6-7.
[69] *Ibid.*, 1956, p. 8.
[70] *Ibid.*, 1954, p. 8.
[71] N.J.L. 1951, c. 286, p. 1032.

in planning and determining the matters of jurisdiction on the bridge.[72]

The act financing the Newark Bay-Hudson County Extension also provided enough funds for the survey to determine the feasibility of an East-West Turnpike which would stretch from Hudson County westward to the Delaware River.[73] By the end of 1956, however, studies were still incomplete and were awaiting a report from the state concerning alternate routes in the area.[74] This was still awaiting action in early 1956, as engineers waited for reports on the plans for alternate routes by other agencies as the Garden State Parkway, and the outcome of the National Highway Program.[75]

Another jurisdictional row developed over the proposed linkup of the Turnpike with the New York Thruway. This tie-up would commence from Ridgefield Park on the Turnpike and connect with the Bergen County exit near Suffern on the Thruway. This project would be dependent on the proof that the Turnpike could more adequately fill the need for a road in this area than could the Garden State.[76] This problem turned into a political "hot potato," as frequent conferences with Bergen County officials over the route to be followed held up final approval.[77]

The operation has not been a smooth one, as many major obstacles have presented themselves during the course of construction. The City of Elizabeth, angered by the Authority's action in moving through a heavily populated area and displacing many of its residents, has carried on a running feud with it for many years. During the course of the action, the city even refused to let its firemen go to fight blazes on the Turnpike, scoffing at the ridiculous figure offered by the Authority to any municipal fire department which was called to fight a fire on the Turnpike.[78] Elizabeth had long since resigned itself to being unable to halt the march of the Turnpike through its environs, but kept its municipal pride by tactics such as these.[79]

The Authority also found difficulty with other municipalities and private citizens in selecting its routes. By the time that the initial project had begun, the commissioners found themselves in fierce fights in nearly every county affected by the new road. Careful adjudication by the members with assemblymen, freeholders, county engineers, and zoning boards succeeded in resolving most of the difficulties. Most of the opposition was centered in Gloucester County near Woodbury Heights, East Brunswick in Middlesex County, and, of course, Elizabeth. The problems confronting commissioners ranged from dispossession of occupants from homes and the severance of farms, which affected individuals, to the closing of roads which intersected the Turnpike and the location and number of interchanges which had an effect upon the economic life of the municipality.[80]

Financing. As related in an earlier section, the New Jersey Turnpike is financed through the issuance of bonds.[81] These bonds are sold on what is known as a forward commitment basis, which enables the Turnpike to obtain reliable commitments for its total financing requirements. It would also provide for the issuance of bonds and payment of the interest thereon, as construction pro-

[72] *The New York Times*, July 22, 1955, p. 61. This project was completed in early summer, 1956.
[73] N.J.T.A. 1953, p. 78.
[74] *Ibid.*, 1956, p. 10.
[75] *Ibid.*, 1955, p. 49.
[76] *Ibid.*, 1952, p. 67.
[77] *Ibid.*, 1954, p. 9.
[78] *The New York Times*, August 30, 1953, p. 92.
[79] *Ibid.*, April 11, 1950, p. 30.
[80] N.J.T.A. 1949, pp. 15-16.
[81] N.J.L. 1948, c. 454, p. 1864.

gressed and the need for funds actually arose.

The plan was put into operation and within a few months the Authority had what it termed "satisfactory assurances that the entire amount would be subscribed."[82]

The cost for the south sector of approximately 87.2 miles was to be $63,875,000 while the northern 30.1 miles would cost $93,300,000.[83] The grand total, which included the repayment for displaced utilities and other obligations to the Highway Department, engineering costs, legal costs, contingencies, and interest came to $230,000,000.[84]

Two significant factors may be noted here. First, the estimates were prepared by different concerns, one of them covering the north sector, above New Brunswick, and the other working on the section below it.

The fact that four concerns were required to estimate the 30 miles gives some idea of the enormity of the task of putting through a Turnpike in this area. There is no indication of whether the figure arrived at is an average or a compromise derived by the four concerns, or whether each one of them estimated a particular area. The enormity of the cost for the northern section is of interest. It proves one good reason why the tolls in northern New Jersey are higher than those in South Jersey. The Turnpike has never explained this aspect of the problem with regards to revenue, and one can only draw the conclusion that tolls were lower in southern New Jersey because the Authority did not feel that residents in that area should have to pay for providing their fellow Jerseyites to the north with ease of transportation in a badly congested spot. There is no indication that any of the firms responsibile for the estimates made any such recommendation or took into consideration the unequal toll charges.

In order to meet the cost of the Turnpike, the Authority sold its first set of revenue bonds in Febrruary 1950. The bonds were purchased on a $220,000,000 loan from forty-two investment firms and five savings banks.[85] This gave the Authority the money to progress with their construction, although it was by no means sufficient. In October 1951, an additional sale of $35,000,000 in bonds was made. Later, another issue of bonds was sold with the approval of the bondholders, to provide for new toll booths, more service area, access lanes, work on road shoulders, and additional safety devices. This issue, for $30,000,000,[86] was sold to a group of investment banks on December 1, 1952.[87]

Some of the funds raised in this issue were earmarked for repayment of what was outstanding on the initial series of bonds. On October 14, 1953, the Authority by resolution provided for the repayment of the final amounts due on the first issue by announcing the issuance of the Second Series bonds, to be due on July 1, 1988.

These bonds, in addition to paying off the balance of the initial issue, were to be used to construct the new projects such as the Newark-Hudson Bay Extension and the linkup with the Pennsylvania Turnpike. The money was also to be used to conduct studies for new projects, such as the East-West Turnpike.[88]

Conclusion

The major problem connected with the study of the New Jersey Turnpike Authority is that of its status. Is it a

[82] N.J.T.A. 1949, p. 18.
[83] *Id.*
[84] N.J.T.A. Review and Cost Estimates 1949, pp. 16-17.
[85] *The New York Times*, February 18, 1950, p. 19.
[86] *Ibid.*, September 18, 1952, p. 49.
[87] *Ibid.*, December 2, 1952, p. 48.
[88] N.J.T.A. 1953, p. 36.

private corporation as stated in the enabling legislation? Is it public? Or is it both?

The Turnpike is neither public nor private; but despite protestations from its directors, it lies closer to the public sphere. The only significant characteristic that identifies it as a private corporation is the means of financing. Faced with a severe debt limitation, as well as a severe highway problem, the legislators designated it a private corporation in order that the terrific cost of construction would not be in violation of the state constitution. This legislation was upheld by the State Supreme Court in a declaratory ruling.

Other characteristics of the Authority indicate its public character. In granting the Turnpike the right to exercise eminent domain, the State Supreme Court in its decision labeled it, "a private corporation serving a public purpose." This decision was upheld by the United States Supreme Court.

The power to displace utilities and to take over state and county roads is another example of its public character. While restitution must be made, and all utilities relocated, and all roads returned to the local government, there can be no interference with the Authority if it chooses to move in this manner. Significantly, this writer has not found any attempts to stop the Authority on the part of any township. What few attempts at restraining the Authority from moving where it pleased have come from private citizens.

The relationship of the Authority to the state as to police protection also indicates the public nature of the Authority. Although the Authority defrays the cost of the uniforms and equipment, the men are assigned by the state and operate under state rules. Fines are payable in courts of various subdivisions of the state. The money, however, accrues to the state, and not to the Authority.

The submission of an annual report and the filing of regulations are mere formalities, but they too represent a degree of state control. Nothing is to stop the state from expressing disapproval of these and urging revision. The power of appointment, resting as it does in the governor instead of in the hands of the various bondholders is perhaps the strongest check that the state has on the Authority. It is through this medium that the wishes of the state are made known to the Authority and, from this, one must deduce that the hand of direct state action may be seen in Authority affairs.

There can be little doubt that the state has more than just a passing interest in the Turnpike. Although it does not receive any of the money paid for tolls, it is beyond question that it has benefited greatly from the Turnpike. Since the Turnpike has been open for barely five years, it is too early to evaluate the economic advantage it has brought to the state.

The Turnpike, in short, is not completely public, nor completely private. It cannot be effectively labeled black or white, but gray. However, the shading of gray is quite apparent, as the public character of the Authority appears to be asserting itself much more strongly than the private.

The Economic Advantages of Electricity Supply By Public Utilities and Who Gets Them

By HENRY W. HILLS*

Editor's Note. The author of this article, in submitting his manuscript to *Land Economics*, wrote as follows: "In the November 1956 issue of *Land Economics* was an article entitled, "The Problem of Allocating Capacity Cost," by Ralph K. Davidson. Mr. Davidson makes several references to a paper of mine entitled, "Demand Costs and Their Allocation," which appeared in the *Electrical World* of January 1957. I disagree violently with the conclusions reached by Mr. Davidson as well as to several of his statements in regard to my article but I see no point in conducting an argument . . . . in regard to this matter. Instead, I have written this article in order to present my views on this subject."

THE ELECTRIC public utilities have increased their business tremendously since World War II. The total generating capacity of both publicly-owned and privately owned electric utilities has increased from 50,111,000 kilowatts in December 1945 to 114,472,000 kilowatts in 1955, an increase of 128 percent. The *Electrical World* reports that 7,304,000 kilowatts were constructed in 1956 and states that 59,802,000 kilowatts of new capacity are planned by the industry for construction in 1957 and future years.[1]

The annual kilowatt-hours generated by public utilities show similar gains, having increased from 222,486 millions of kilowatt-hours in 1945 to 547,038 million kilowatt-hours in 1955, an increase of 146 percent. The main reason for the larger percent increase in kilowatt-hours is the large amount of high load factor energy taken by the Atomic Energy Commission, which increased from 2,027 million kilowatt-hours in 1945 to 47,133 million in 1955.[2] Many individual companies show declining annual load factors since the war due to increased poor load factor business such as air conditioning and the elimination of year-round daylight saving. Excluding sales to the AEC, sales to other ultimate consumers increased from 191,531 million kilowatt-hours in 1945 to 433,788 million in 1955, an increase of 127 percent.

On the other hand, electric generation by industrial plants has increased only from 48,769 million kilowatt-hours in 1945 to 78,497 million kilowatt-hours in 1955, an increase of 61 percent.[3] The question naturally arises as to why such tremendous increases in generation by the public utilities as compared to the more modest increases by industrial plants. The purpose of this paper is to discuss some of the reasons.

Mass Production. The electric utility has one big advantage over private-plant generation, and that is the advantage that goes with mass production of kilowatt-hours. By combining the power needs of thousands of customers, it can install large generating units of 100,000 to 300,000 kilowatts capacity. Generally speaking, large machines cost less than small machines on a unit capacity basis. For example, to install a small generating plant of 2000 kilowatts may cost around $250 per kilowatt or more as compared

[1] *Electrical World*, January 28, 1957, pp. 137, 149.
[2] *Ibid.*, p. 109.
[3] *Statistical Abstract of the United States, 1956*, United States Department of Commerce, p. 529.

to about $150 per kilowatt for a large 200,000 kilowatt generator. Also, operating costs, excluding fuel, are much higher for the small installations which might cost as much as $13 per kilowatt per year for operation and maintenance as compared to about $2 per kilowatt for the larger machine. The efficiency of the smaller units is much less than for the larger units, whereas the smaller units use one pound of coal or more (or the equivalent in oil or gas) to generate one kilowatt-hour, the larger machines use only three-fourths of a pound of coal (or the equivalent in oil or gas). Thus the economic advantage due to mass production of kilowatt-hours is tremendous. Another advantage due to concentration of generation in public utility plants is the reduction in reserve capacity requirements. Whereas interconnected and integrated public utility systems have reserve capacities of from 12 to 15 percent of their peak load, it is not uncommon for private plants to require 50 to 100 percent reserve capacity, to insure the same degree of continuity of service as is supplied by the public utility.

Diversity Benefits. Another big advantage that public utility plants have over private generating plants is that they can take advantage of diversity. If all the customers of a public utility installed their own generating facilities to supply their own peak loads, the total installed capacity would be several times that of the public utility, even without including anything for spare or reserve capacity. The reason for this is diversity.

Some peak loads occur in the summer, air conditioning for example. Other peak loads occur in the winter, lighting for example. Some peak loads occur in the morning, most industrial for example, and not all industrial customers have their peak loads at the same time; some may be in one month and others in another month. Office buildings generally have their peak loads in the morning and afternoon, while residences have their peak loads in the evening. This matter of diversity is a tremendous subject, and the electric utilities have conducted mountains of research to determine its magnitude and characteristics. The economic benefits due to taking advantage of diversity are tremendous.

This leads us to the question as to who benefits from all this diversity. The trite answer is to say that the customers benefit. Certainly they do, as a group, for under regulation, utility earnings are limited to a fair return. But *what* customers, and to what extent? This is a tremendously difficult question to answer as the solution of the problem depends upon a correct allocation of jointly-used investment and jointly-incurred costs. And whenever an allocation is made, there are many methods of making it and each method has its advocates.

Peak Responsibility. Let us assume that an electric utility has one customer (or group of customers), Customer A, whose maximum load is 100,000 kilowatts. It also has another customer (or group of customers), Customer B, whose maximum load is 75,000 kilowatts. For the purpose of simplicity, let us further assume that there is no overlapping of loads, that the load of Customer A is in the summer time and the load of Customer B is in the winter time. By serving both customers the public utility uses the same plant and a capacity of 100,000 kilowatts (plus adequate reserves) is all that is required to serve both loads. Thus a large economic saving is made in contrast with the situation where one plant would be required for Customer A and another plant for Customer B.

One common method of allocation is the peak responsibility method which

assumes that the cost of all of the plant should be charged to the customer (or customers) who uses power at the time of the peak load. Under this method, Customer A would pay for the entire fixed charges of the plant and Customer B would be charged none. In other words, this method of allocation would give all of the economic benefits to Customer B. The argument is something like this: As the load of Customer A increases, additional plant capacity must be installed and, since it is Customer A alone who is responsible for the requirement for this additional capacity, he alone should pay for it. It sounds good, doesn't it? Especially when stated in such terms as the marginal or incremental capacity cost of producing a unit of output should be charged to the output produced and consumed during the peak hours. In other words, since the off-peak customers are not responsible for the marginal or incremental cost of producing a unit of output, they should be charged nothing, except the "bare-bones" incremental energy costs.

Non-coincident Demands. However, there is another school of thought which maintains differently. Customer A alone would require a plant of 100,000 kilowatts which would cost, say, $20,000,000. Customer B alone would require a plant of 75,000 kilowatts which would cost, say, $15,000,000. The total cost of both plants would be $35,000,000. The electric utility can serve both customers with one plant which costs $20,000,000. There is thus an economic saving of $15,000,000 by the electric utility. If this saving is apportioned between A and B on a percentage basis, 20/35 to A and 15/35 to B, we get the following results:

	A	*B*	*Total*
Cost of Plant for individual supply	$20,000,000	$15,000,000	$35,000,000
Saving due to electric utility supply	8,600,000	6,400,000	15,000,000
Cost with electric utility supply	$11,400,000	$ 8,600,000	$20,000,000

Quite obviously, the same answer is obtained by allocating the utility's cost in accordance with the peak loads of A and B. In this case, A is charged 20/35, or 57 percent of the cost of the plant and B is charged 15/35, or 43 percent of the cost of the plant:

Many people believe that the latter method of allocation, called the non-coincident demand method, is much more equitable in the division of the economic savings brought about by the utility serving the loads of both A and B from the same plant than is the peak responsibility method which would charge Customer A for the entire investment of $20,000,000. And the same principle holds true of incremental costs. If the loads of A and B grow at the same percentage rate, A will continue to pay 57 percent of the cost of the additional plant and B will continue to pay 43 percent. Now let us suppose that the loads of A and B do not grow at the same percentage rate. If A has the faster growth, he will be charged for a higher percentage

	A	*B*	*Total*
Peak load—kw	100,000	75,000	175,000
Per Cent	57	43	100
Utility's Cost	$11,400,000	$ 8,600,000	$20,000,000

of the cost as the years go by and likewise, if B has the faster growth, he will likewise be charged for a higher percentage of the total cost. In the writer's opinion, this does not constitute discrimination or the subsidizing of the peak customer A by the off-peak customer B.

Equal Division of Savings. Another method of allocation between A and B is to divide the savings equally between them. Under this method, the results would be as follows:

	A	*B*	*Total*
Individual plants	$20,000,000	$15,000,000	$35,000,000
Savings due to joint Operation	7,500,000	7,500,000	15,000,000
Cost as allocated	$12,500,000	$ 7,500,000	$20,000,000

The reasoning behind this method of allocation is that a 50-50 split of the savings is the result which would be arrived at between two independent parties at arm's length bargaining. Considerations from another point of view also lend support for this method. It is not the entire plant which is jointly used by A and B, but only that portion which is represented by the 75,000 kilowatts taken by B. This portion should therefore be divided equally between A and B and, since the rest of the plant is used by A alone, he should be charged for the excess amount. The cost allocation is therefore built up as follows:

	A	*B*	*Total*
Jointly-used plant	$ 7,500,000	$ 7,500,000	$15,000,000
Sole use of A	5,000,000	0	5,000,000
Cost as allocated	$12,500,000	$ 7,500,000	$20,000,000

It is obvious that the latter computation is merely another way of dividing the savings equally between them since the economic saving due to joint operation is the cost of B's plant. An interesting result of this method is that an off-peak user pays the full demand cost on 50 percent of his demand.

Strictly speaking, A should pay only the incremental cost of a 100,000 kilowatt plant over that of a 75,000 kilowatt plant, so if we assume that the cost of a 75,000 kilowatt plant is $210 per kilowatt, it would cost $15,750,000 and the additional capacity of 25,000 kilowatts would cost $170 per kilowatt, or $4,250,000.

	A	*B*	*Total*
Jointly-used plant	$ 7,875,000	$ 7,875,000	$15,750,000
Sole use of A	4,250,000	0	4,250,000
Cost as allocated	$12,125,000	$ 7,875,000	$20,000,000

This latter refinement in allocation of cost is very difficult to make as the cost of the plant to B is unknown. Consequently, it is customary to use the same unit cost for both A and B, which is the average unit cost of the utility's plant.

Phantom Customer Method. The above methods of allocation ignore a basic principle which the writer believes to be fundamental in cost allocation. This principle is a very old one, and is that the charge for the use of a facility should bear some relationship to the length of time or the number of times it is used. Railroad fares are by the mile, city transportation by the ride, toll roads by the

mile, toll bridges by the crossing, hotel rooms by the day. If a person rents a car, he does not expect to pay for a whole year's use if all he wants to use it is one day, a week, or a month. Likewise with utility plant, a customer who uses that plant for only one day or week should not pay the fixed charges (or rental) for a whole year if other customers are using the plant at some other time in the year. If a kilowatt of capacity is used by Customer A for 1000 hours and the same kilowatt of capacity is used by Customer B for 3000 hours, it seems to the writer that a fair allocation of cost would be to charge on the basis of hours use, or kilowatt-hours. This would result in an allocation of one-fourth of the cost to A and three-fourths to B.

It was on the basis of the above thinking and other factors that the writer developed a method for the allocation of fixed charges known as The Phantom Customer Method, for which he was awarded the Henry L. Doherty Medal at the Atlantic City convention of the National Electric Light Association in May 1926.[4] To apply this method to the case at hand requires the kilowatt-hour takings of Customers A and B, so let us assume that Customer A, with a load of 100,000 kilowatts, takes 100,000,000 kilowatt-hours and that Customer B, with a load of 75,000 kilowatts, takes 225,000,000 kilowatt-hours. The average demands of A and B throughout the year are 11,400 and 25,700 kilowatts respectively, (kilowatt-hours divided by 8,760 hours). The allocation by the Phantom Customer Method is as follows:

	A	*B*	*Total*	*System*
Method 1				
(1) Total demand	100,000	75,000	.....	100,000
(2) Less average demand	11,400	25,700	.....	37,100
(3) Excess over average at time of system peak	88,600	0	88,600	62,900
(4) Allocation of excess system demand per line (3)	62,900	0	62,900	.....
(5) Demand as allocated line (2) plus line (4)	74,300	25,700	100,000	.....
(6) Cost as allocated at $200 per kw	$14,860,000	$5,140,000	$20,000,000	.....

The above method allocates the unused capacity according to excess use at the time of the system peak. This method of allocating unused capacity has been criticized. Many authorities believe a more equitable division is to allocate the unused capacity in accordance with the excess demand of each class of service regardless of the time it occurs. The following computation is on this basis:

[4] H. W. Hills, "Demand Costs and Their Allocation," *Electrical World*, January 22, 1927, p. 198.

	A	*B*	*Total*	*System*
Method 2				
(1) Total demand	100,000	75,000	175,000	100,000
(2) Less average demand	11,400	25,700	37,100	37,100
(3) Excess over average	88,600	49,300	137,900	62,900
(4) Allocation of excess system demand per line (3)	40,400	22,500	62,900	.....
(5) Demand as allocated line (2) plus line (4)	51,800	48,200	100,000	.....
(6) Cost as allocated at $200 per kw	$10,360,000	$9,640,000	$20,000,000	.....

Method 2 was not described in the writer's paper but was given much consideration by him and his contemporary associates in The Philadelphia Electric Company before the paper was submitted. The reason that Method 1 was adopted in preference to Method 2 is that, at that time, a major portion of the Company's off-peak business was marginal. The Company was still engaged in shutting down isolated (private) plants in considerable numbers each year. Also in regard to new industrial load, which by its nature was largely off the system peak (which was caused by the lighting load), competition with private generation was keen. In those days, the electric utility did not have as large an economic advantage over private plant generation as it has today. However, it was our judgment that off-peak users should have allocated to them an amount which represents a fair rental for use of the facilities required and used to serve them.

Method 2 gives the same results as the "Used and Unused Capacity Method" developed by Mr. W. J. Greene.[5] This method allocates the unused capacity according to the excess demands of each class of service, regardless of the time they occur. Although the writer's paper was not printed in the *Electrical World* until January 22, 1927, it had been submitted to the prize award committee of the National Electric Light Association in March of 1926, several months in advance of Mr. Greene's article. It appears that Mr. Greene and the writer arrived at the same basic concept at about the same time, although we were not in agreement as to the best method of allocating the unused capacity, probably because of differences in territorial load conditions.

Comparison of Methods. A comparison of the allocated results by the above methods is as follows:

	A	*B*	*Total*
(1) Peak responsibility	$20,000,000	$ 0	$20,000,000
(2) Non-coincident Maximum Demands	11,400,000	8,600,000	20,000,000
(3) Split savings (a)	12,500,000	7,500,000	20,000,000
(b)	12,125,000	7,875,000	20,000,000
(4) Phantom customer			
Method (1)	14,860,000	5,140,000	20,000,000
Method (2)	10,360,000	9,640,000	20,000,000

One factor to keep in mind in the adoption of any allocation method is that the accuracy of the allocation can be no better than the accuracy of the basic data upon which the allocation is made. For this reason, the use of the peak responsibility method inherently involves the practical difficulty of determining the loads of each individual class of service during the peak load period. For an average electric utility, this is a tremendous task, involving test data on many sample installations. The determination of the non-coincident maximum demands by classes of service is a still more difficult task for the average electric utility. Test data must be secured on many sample installations for each class of service over a sufficiently long period of time to make sure that the load is taken at the time of the class peak. This is no mean assignment. The Phantom Customer Method has the advantage that 60 percent of the cost, in the average electric utility, is allocated on the basis of kilowatt-hours which are metered and ac-

[5] W. J. Greene, "Allocating Capacity Costs," *Electrical World*, May 29, 1926, p. 1190.

curate by classes of service. Consequently the errors in the determination of the demands by classes of service are limited to only 40 percent of the cost.

The subject of power factor has been omitted from this discussion as its effect on the cost of production facilities is minor. Any allocation of transmission or distribution facilities should, of course, reflect differences in power factor and other special considerations, such as the customer component of cost.

In closing, the writer wishes to point out that any allocation method used must be appropriate for the conditions to which it is applied. In the above example, does the Utility Company have the same responsibility to Customers A and B? Do both loads have to be served at the time and in the amount required by each customer? Is A incremental to B, or is B incremental to A, or should A and B be considered on the basis of equality? In practice, many different situations exist, and each one should be treated on its own merits. If a customer can regulate his load so as to stay off peak and thus bring about an economic saving, he deserves special treatment.

An electric utility is under the obligation to develop the load of all of its customers as far as it can be done on an economic basis. Charging the peak load customers for the entire cost of the plant may result in such high charges that their load growth is affected adversely. If this is the case, the Company's growth both revenue-wise and profit-wise may also be affected adversely. Certainly the need for additional new capacity would be reduced and the Company and all its customers would suffer because of its inability to install the larger new equipment with its lower operating costs.

The following table shows that the average revenue, in cents per kilowatt-hour sold, of the Class A and B privately-owned public utilities increased only 7.5 percent from 1945 to 1955, while the wholesale price index increased 64 per-

Comparative Statistics

	1945 Millions	*1955 Millions*	*Increase Millions*
Electric utility plant[1]	$12,176	$30,307	$18,131
KW generating capacity[1]	40.0	87.4	47.4
Operating revenue[1]	$ 3,171	$ 7,199	$ 4,028
Kilowatt-hours sold[1]	203,541	429,858	226,317
	Unit	*Unit*	*Percent Increase*
Revenue-cents per kwh sold (computed)	1.558	1.675	7.5
Plant investment per kw of generating capacity (computed)	$304	$346	14
Wholesale price index[2]	71.3	117.0	64
Consumer price index[2]	76.9	114.5	49
Construction cost index—July 1 North Atlantic States[3]	265	512	93

[1] Federal Power Commission, *Statistics of Electric Utilities in the United States, 1955, Privately Owned*, Electric Utility Plant, p. XXVIII, Operating Revenues, p. XXX, Kilowatt-hours Sold, p. XXXI, Generating Capacity, p. XXXIII.

[2] United States Department of Commerce, *Statistical Abstract of the United States, 1956*, Wholesale Price Indexes for All Commodities, p. 320, Consumers' Price Index, p. 324.

[3] *Handy-Whitman Index of Public Utility Construction Costs*, compiled by Whitman, Requardt and Associates, Baltimore, Maryland, Bulletin No. 65, pp. 11-12.

cent, the consumer price index (cost of living) increased 49 percent and the cost index for electric utility construction (North Atlantic States taken as indicative for nation) increased 93 percent. The total investment in electric utility plant (including production, transmission, distribution and general plant) per kilowatt of generating capacity increased only 14 percent. On an incremental basis, the increase is 26 percent. This relatively small increase reflects the benefits of technological improvements such as the lower cost per kilowatt of the larger sized generating units installed during the period as well as lower distribution investment per kilowatt due to higher load density, both of which are brought about by load growth.

The record of the electric utility industry, since the war, is an enviable one. In the face of enormous rising costs for labor, fuel and equipment, its rates have remained practically stable. Due to the rapid increases in its load since the war, the electric industry has been able to take advantage of the advances in technology in the manufacture and utilizaation of electric equipment. The result of installing millions of dollars of new, more efficient equipment has been that the industry has been able to absorb tremendous increases in costs without comparable increases in rates. However, recent increases in interest rates and ever-rising costs of labor and equipment, if continued, can be followed by only one result—increased rates.

Reports and Comments

Vietnamese Land Transfer Program†

THE GOVERNMENT of free Viet Nam has recently initiated a land transfer program affecting some 320,000 cultivators, approximately 2,200 landowners, and an area of approximately 760,000 hectares of riceland.[1]

The land transfer is based on the terms of Ordinance No. 57 promulgated October 22, 1956. The Ordinance provides that no person may own more than 100 hectares of riceland, and all persons holding more than that amount as of the date of the Ordinance must sell the excess to the government, which in turn will sell it to cultivators. (A later modification provides that until formal government expropriation takes place, landowners may sell parcels of up to 3 hectares to sitting tenants or other individuals if they are not members of the immediate family.) The Ordinance exempts land planted in what are termed "industrial crops," including substantial holdings in rubber (largely owned by French citizens), and areas in forest, sugar cane, tea, coffee, coconuts, fiber crops, fruit, etc. Owners selling land to the government will receive 10 percent of the purchase price in cash and the balance in non-negotiable government bonds bearing 3 percent interest per annum. The bonds will be redeemed over a period of 12 years. Cultivators who purchase land from the government will pay for it in six equal annual installments with no interest. The landowner will receive his land rent payment at the harvest of the crop year in which the transfer is effected, and the new owners will begin their payments at the time of the following harvest. The Ordinance stipulates that, in addition to the 100-hectares-retention limit, owners may retain up to 15 more hectares of land bequeathed to them for private ancestor worship. It establishes priorities for purchase, allowing sitting tenants first option, and after them local landless laborers followed by veterans and war victims. Other provisions provide for the establishment of a group of commissions to deal with such unsettled matters as land prices, areas to be retained for ancestor worship, and arbitration of claims arising out of the implementation of the Ordinance; and penalties for evasion or opposing the implementation of the Ordinance. In general, the terms of the Ordinance tend to be quite general and an important group of decisions is left to the commissions which must operate almost without legislative guidelines.

Accurate statistics on the distribution of land ownership in Viet Nam are not available. The best estimate available to the author is summarized in Table I, and is based largely on information two decades old.

Landowners were required to declare the land available for transfer by February 28, 1957. Although a few are known to have failed to comply with the regulation and are being searched out and proceedings instituted, to date 2,170 persons owning more than 100 hectares have declared total holdings amounting to 976,602 hectares. These declarations, however, have not yet been checked by survey measurement. Since each owner may retain 100 hectares, the returns indicate some 759,602 hectares are available for transfer. If each owner is able to justify a claim to the maximum of 15 hectares which may be reserved for ancestor worship, the land available for transfer might be reduced by as much as 32,550 hectares to a total of 727, 050 hectares. It is unlikely such large claims will be allowed, however. Inclusion of delinquent returns in the final tabulation is not expected materially to alter these totals.

The Vietnamese Institute of Statistics and Economic Studies reports 1,993,500 hectares of riceland were cultivated in the 1955-56 crop season. Estimates derived from 1934

† In this note, information not acknowledged by footnotes to published sources is derived from private communications from Vietnamese Government officials, the author's estimates, etc.

[1] G. Peautonnier, "Contribution a l'etude des conditions de l'exploitation de la riziere en Cochinchine," *L'Information d'Indochine Economique et Financière*, December 1946.

figures quoted by Peautonnier indicate an additional 457,000 hectares of privately-owned land still lie idle as a result of disturbances over the past decade.[2] Thus out of a total of approximately 2,450,088 hectares of riceland in free Viet Nam, some 40 percent is held by landowners having over 100 hectares.

Virtually all land subject to transfer lies in the provinces to the south and west of Saigon. In this area lie a total of some 2,185,588 hectares of rice fields, including almost all the abandoned land. (This total includes the 2,049,928 hectares in 14 major rice-growing provinces tabulated in Table I plus an estimated 135,660 hectares in 6 minor rice-growing provinces.) The current number of individuals owning land in this area is not known, but the best estimate is the total given in Table I, even allowing for concentration of ownership and for riceland owners in minor provinces. Assuming this total of 255,056 riceland owners in 1934 is still relatively valid, in the area where the transfer is to take place the 1 percent of the owners holding more than 100 hectares claim title to some 45 percent of the total riceland.

Comparison with the 1934 figures in Table I indicates a substantial concentration of ownership has taken place in the last two decades. The area held by individuals owning more than 100 hectares has climbed from 733,800 to 976,602 hectares, while the absolute number of such large owners has declined from 2,693 to 2,170. Where 1 percent of the owners held 36 percent of the total riceland in 1934, they now own 45 percent of the total.

In general, the provinces farther from Saigon are the ones with the higher concentration of ownership. The landlord returns indicate that in the minor rice-growing province of Tay Ninh, for instance, only 9 percent of the riceland belongs to individuals owning over 100 hectares. A comparable 1934 figure is not available. Of the major rice-growing provinces for which Peautonnier

[2] *Ibid.*

TABLE I—VIETNAMESE RICELAND OWNERS CLASSIFIED BY SIZE OF RICELAND HOLDINGS AND AREA IN VARIOUS-SIZED HOLDINGS*

Region	Classification by Size (hectares)	Number of Landowners	Percent of Landowners in Size Classification	Area Owned (hectares)	Percent of Cultivated area in Size Classification
Central Viet Nam[1]	Less than .5	450,000	68.7	[2]	[2]
	.5 ot 2.5	165,000	25.2	.....	.....
	2.5 to 5	31,000	4.7	.....	.....
	5 to 25	8,500	1.3	.....	.....
	25 to 50	300	.1	.....	.....
	Over 50	50	negl.	.....	.....
TOTAL		654,850	100.0		
South Viet Nam[3]	Less than 1	85,933	33.7	42,966	2.1
	1 to 5	97,060	38.1	194,120	9.5
	5 to 10	37,616	14.8	263,312	12.8
	10 to 50	28,141	11.0	562,820	27.5
	50 to 100	3,613	1.4	252,910	12.3
	100 to 500	2,449	.9	489,800	23.9
	Over 500	244	.1	244,000	11.9
TOTAL		255,056	100.0	2,049,928	100.0

* Adapted from Yves Henry, *L'Economie Agricole de l'Indochine*, (Hanoi: Gouvernement Generale de l'Indochine, Inspection Generale de l'Agricole, de l'Elevage et des Forets, 1932); and G. Peautonnier, "Contribution a l'Etude des Conditions de l'Exploitation de la Riziere en Cochinchine," *l'Information d'Indochine Economique et Financiere*, December 1946.

[1] Applies chiefly to northern provinces.

[2] Unavailable.

[3] Fourteen major rice-growing provinces.

quotes figures, the lowest concentration in 1934 was 14 percent in Cholon province adjoining Saigon. By 1957 this had increased to 24 percent. At the other extreme, in the province of Rach Gia on the coast southwest of Saigon, some 62 percent of the total riceland is in the hands of large landowners as compared to only 52 percent in 1934.

In the absence of accurate land tenure information it is difficult to estimate how many tenants will be affected by the land transfer. In the area where most of the transfers will take place, the average tenant holding is approximately 2 hectares or perhaps slightly more. Since it is likely landlords will be apt to retain riceland now under cultivation, the land available for transfer probably will include a substantial proportion of land abandoned during the disturbances of the past decade. It is thought that about 225,000 hectares of the land available for transfer is not currently cultivated. Of the remaining 534,000 hectares, the best estimate of sitting tenants affected by the land transfer is thus about 265,000. The government is making every effort to encourage recultivation of abandoned land. Tenant holdings on formerly abandoned land recultivated to date are about 2 hectares, but the government hopes future holdings on abandoned land will average about 4 hectares. To the sitting tenants, therefore, must be added approximately 55,000 additional cultivators who will benefit, largely drawn from refugees from North Viet Nam and local landless laborers. Thus, a total of some 320,000 cultivators will be benefited by the land transfer program.

Of the 759,602 hectares of riceland subject to transfer, approximately 180,000 hectares are owned by French citizens. By far the largest part of this land is worked by tenant cultivators. The French Economic and Technical Mission to Viet Nam has announced that this riceland will be purchased from its present owners by the French Government and be turned over to the Government of Viet Nam for redistribution to cultivators. Current negotiations being carried on by the French and Vietnamese are devoted to working out the details of this program.

It is not expected that the land transfer program will have an appreciable immediate impact on rice production nor upon the pattern of cultivation. Virtually the whole area affected is now cultivated by tenants. Landowners in Viet Nam provide almost no management function for their tenants who follow traditional planting dates and cultivation techniques. Little fertilizer is used. Although before World War II many large landlords were a primary source of credit for their tenants, post-war Communist guerrilla warfare in Viet Nam greatly reduced their willingness to make loans. Currently, most credit in rural areas comes either from local merchants, often Chinese, or from small or medium landowners who live in villages rather than urban centers and who are thus in a position to collect their loans. The government is embarking on a $5 million national agricultural credit program which it hopes will replace any credit now coming from large landowners and a substantial portion of that from small landowners and merchants.

The government estimates a total of some $85 million will be necessary to purchase the land affected. If the French Government makes full payment for the land owned by its nationals, as seems likely, the Vietnamese Government burden might be reduced to some $61.5 depending upon the terms agreed upon by the two governments. The cash down payment paid by the Vietnamese would thus come to some $6.1 million. It is hoped that landowners receiving bonds in compensation can be encouraged to use them as collateral for loans for general industrial development. This program would be correlated with United States and other foreign aid available to Viet Nam, although details have not yet been worked out.

It is estimated that the administrative costs of the land transfer program may come to some $2 million spread over a three-year period, with heaviest expenditures during 1958. The program is to be administered through the Department of Agrarian Reform which already has responsibility for the rent reduction and tenure security program. Provincial offices will be expanded in the areas affected, additional cadastral personnel trained to measure retention limits and plots transferred to cultivators, and village-level committees of landlords and tenants established to implement the transfer and collect payments from new owners. These committees will also have responsibility for administering the rent reduction and tenure security program. Agrarian tribunals will be organized to hear disputes arising from the

land transfers and perhaps from the rent reduction and tenure security program.

Although the basic land transfer legislation was promulgated in the fall, the implementation of the program has been slowed by administrative problems. At the time the Ordinance was promulgated it was the intent of the government to reorganize the Department of Agrarian Reform. The man appointed as the new Secretary, Mr. Do Van Cong, a ranking official in the Presidency, was unable to assume his duties until late November and subsequently experienced difficulties in securing appointment of the competent personnel he felt necessary for his program. Then, in February 1957, when the Secretary was momentarily expecting final approval of his new staff, he was seriously wounded during an assassination attempt on the life of President Ngo Dinh Diem. As of this writing, May 1957, President Diem has postponed new steps in the land transfer program until the Secretary can return.

During the period from the time he assumed his post until he was wounded, Secretary Cong had undertaken three important preliminary actions. The first was to call for landlord declarations of land held in excess of 100 hectares, as mentioned earlier. Currently the Cadastral Service is working in the field checking these declarations.

The second step—intended as a concrete expression of the government's resolve to carry out the land transfer program—was to arrange token transfers throughout the South. The normal pattern was to find some landlord willing to allow the government to make a transfer of land to sitting tenants before the final details of the program had been settled. Then, at a brief ceremony in the ricefields, Secretary Cong or another ranking official formally announced the transfer to the tenants. For the landlords, this amounted to accepting the Secretary's personal word that they would be treated fairly under terms of subsequently announced administrative regulations. Although having elements of unfairness, it is unlikely the landowners volunteering their land under these terms will be placed at a disadvantage. Under the terms of Ordinance No. 57, landowners will receive their full normal rent for this agricultural season, while land prices are to be set by a commission on a regional basis and are to be paid to all owners in the area. To date, 2,408 tenants have received holdings amounting to 4,235 hectares. The program has been attended by the fullest publicity in the local press.

A third important step, announced by the Secretary February 18, 1957, is a cause for some concern. Under the terms of Ordinance No. 57, landowners could not transfer land after October 22, 1956, the date the Ordinance was promulgated. However, landlord groups succeeded in exerting enough pressure within the government to secure a modification allowing them to sell land in units of not more than 3 hectares. Sitting tenants must be given priority—although no credit facilities are provided—and land may not be transferred to members of the immediate family. The modification represented a compromise between the pressures exerted by the landlord groups and the well-recognized danger of "paper" transfers to family members to bring each individual's holding within the 100 hectare limit. Although it is too early to know what effect this modification will have on the program, it is not thought it will be extensive. Most tenants are expected to await the implementation of the Ordinance which they expect will give them a more favorable price, while the 3-hectare limit to each parcel reduces the attractiveness of buying land as an investment or hedge against inflation.

The current land transfer program has its roots in an earlier attempt at agrarian reform embodied in a series of ordinances promulgated in June, 1953. These ordinances, issued at a time when the nation was racked with civil war, were largely of propaganda value and were never implemented. Among other provisions, they limited holdings in South Viet Nam to 100 hectares, the limit carried over into the current program. They also provided for reduced rent and increased tenant security.

Soon after the Geneva convention in July 1954 which divided Viet Nam into two parts, one free and one Communist-controlled, the government recognized the importance of agrarian reform as a means to increase the stake of the peasant in an independent nation and to improve rural social structure. At that time, however, the government did not have the resources to carry out a land transfer but instead undertook the logical and closely correlated first step of instituting a rent reduction and tenure security program. As a

result of recent success in stamping out internal subversion and structuring a sound economy, the government felt it could embark on the land transfer phase of its agrarian reform.

The United States, through the International Cooperation Administration United States Operations Mission to Viet Nam, has been closely interested in the whole agrarian reform program which it considers a prime means by which to establish a stable nation. It has provided technical assistance, funds for study missions to other Asian nations, and funds to support the administration of the rent reduction and tenure security program. It has agreed to make available up to $2 million in local currency during the next three years to help support the administration of the land transfer program. At the same time, it has embarked on a large land development program which will put into cultivation some 39,000 hectares of land in the coming year on which approximately 9,000 families will be established and become new owners.

PRICE GITTINGER

United States Operations Mission to Viet Nam
International Cooperation Administration

Suburban Residential Land Values Along the C. B. & Q. Railroad

THE LOBATE pattern of the suburban communities extending outward from Chicago along the railroads is well known. Homer Hoyt described the pattern in 1933,[1] and Harold Mayer compared these urbanized extensions to beads on strings,[2] an analogy which is obvious from an examination of any large-scale map of the Chicago Metropolitan Area.

The purpose of this investigation is to describe the pattern of one of these urbanized extensions as reflected in residential land values and to relate the value of the residential land to lines of public transport, to industrial areas and to any topographic features which seem to affect the value of the nearby residential property.[3]

Suburban Residential Land Values and Public Transportation

Map I, *Metropolitan Chicago*, indicates the lobate pattern of suburban Chicago. The lobe comprising the string of suburban communities from Cicero west through Downers Grove is the one with which we are concerned. It is the so-called West Suburban urbanized area served by and to a large extent dependent on the Chicago, Burlington and Quincy Railroad from Cicero to Downers Grove, a distance of about fifteen miles.

The Burlington suburban service is the only public transportation serving the entire area, but even in parts of the area where it competes with other forms of public transportation it is certainly the fastest and, due to recent modernization, it is generally conceded to be the best.[4]

Residential land values along the C.B. & Q. lobe are rather high relative to other extensions. It is an area of high grade, dormitory suburbs with several small but well zoned and developed industrial areas, principally along the Indiana Harbor Belt Railroad.

The area of high residential land values at the north edge of the *block* diagram north of the C.B. & Q. Railroad but within the diagram is where residential land values have risen as a result of the location of the Congress Street Expressway now under construction. It would be interesting, though it is not within the scope of this paper, to trace the development of the area adjacent to the Congress Street freeway to determine the point in construction or the point in local political history that residential land values began to rise as a result of the proposed highway. Or more speculatively, what would happen to that lobe of high residential land values if construction of the highway were suddenly stopped and the entire project dropped?

[1] Homer Hoyt, *One Hundred Years of Land Values in Chicago* (Chicago: The University of Chicago Press, 1933).

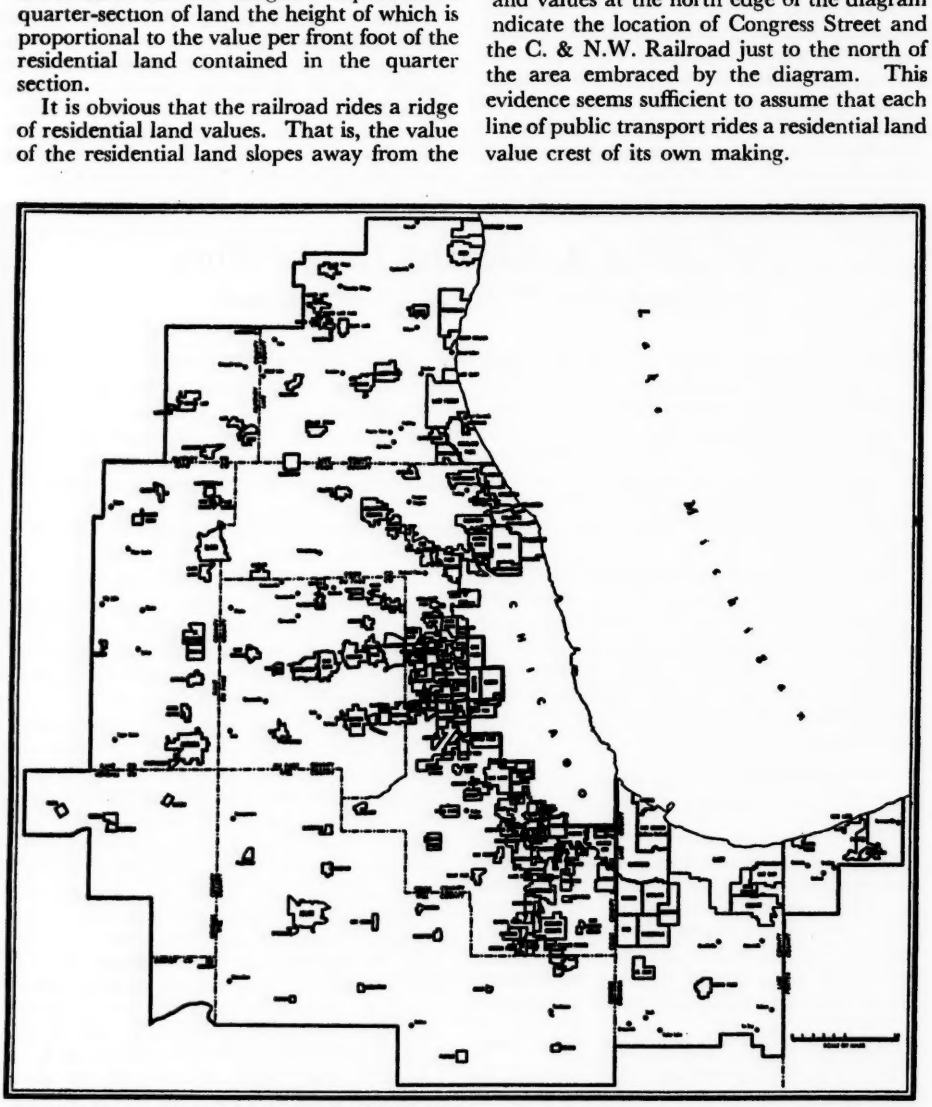
[2] Harold M. Mayer, "Moving People and Goods in Tomorrow's Cities," *Annals of the American Academy of Political and Social Science*, November 1945, pp. 116-128.

[3] Data are from Olcott's various Land Values Blue Books for the Chicago Area for the year 1953 or adjusted to 1953. Values have been spot checked with records of real estate transactions in Western Springs, La Grange and Riverside.

[4] "Are Commuters Worth It?" *Railway Age*, February 8, 1954, pp. 61-64.

The *block* diagram embraces the suburban communities served by the C.B. & Q. and overlaps to the north the area to be served by Congress Street and part of the area served by the C. & N. W. Railroad suburban service. Each cube on the diagram represents a quarter-section of land the height of which is proportional to the value per front foot of the residential land contained in the quarter section.

It is obvious that the railroad rides a ridge of residential land values. That is, the value of the residential land slopes away from the rail line parallel to the right of way, in this case to the north and to the south. The Douglas Park and the Garfield Park elevated lines (marked C.T.A. on the *block* diagram) also ride value ridges. The rising residential and values at the north edge of the diagram ndicate the location of Congress Street and the C. & N.W. Railroad just to the north of the area embraced by the diagram. This evidence seems sufficient to assume that each line of public transport rides a residential land value crest of its own making.



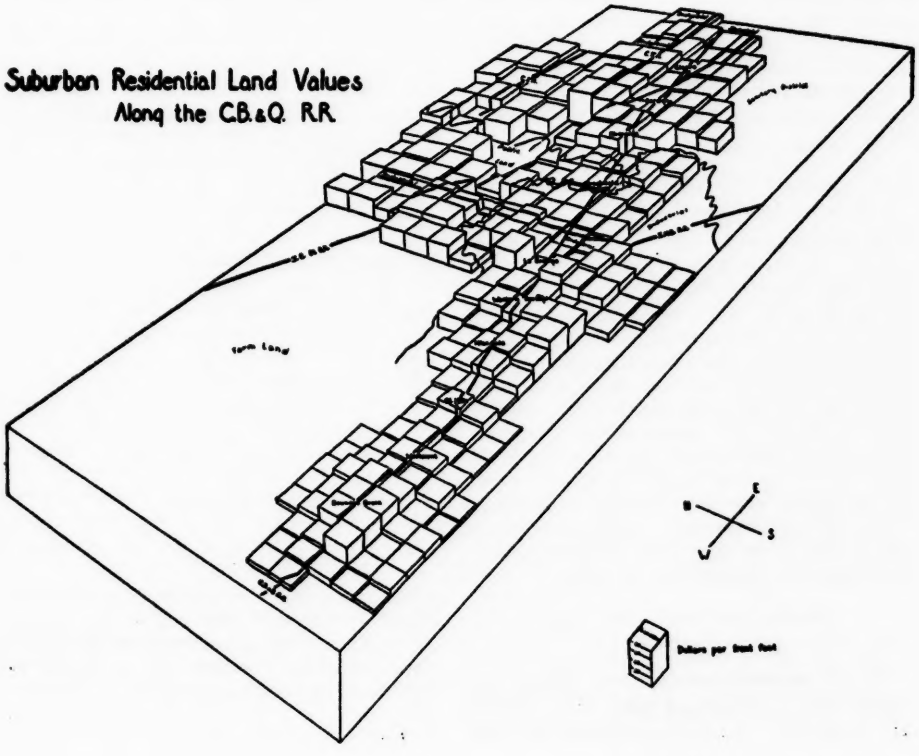
MAP 1: METROPOLITAN CHICAGO. The above area embraces a population of more than 5,500,000. Extending some 40 miles from the city's center, the area embraces hundreds of places besides Chicago itself. The map shows only the 195 incorporated places and 50 unincorporated places, which latter, because of their size, merit inclusion.

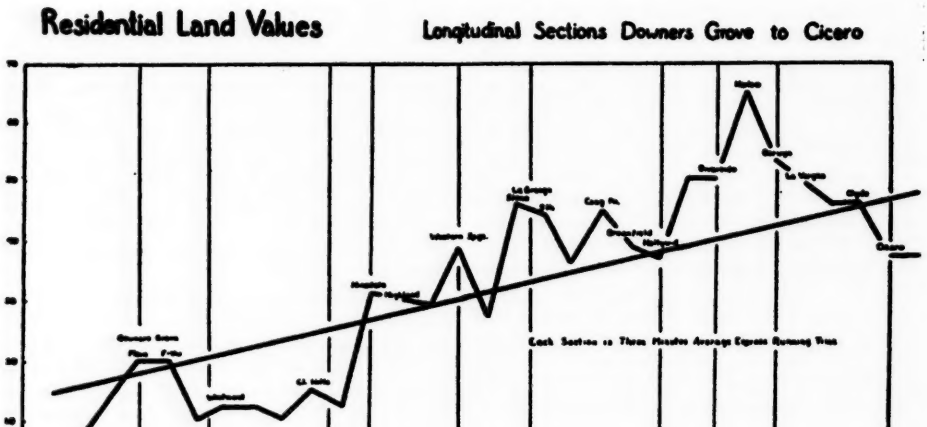
An inspection of the *block* diagram reveals that residential land values not only slope away from the rail line but dip between each station. Values form a modified cone or pyramid around each station but with each successive cone tending to be a little higher than the last as one approaches the city. The *longitudinal sections* graph reveals this concept with the stations at the high points on the graph and the areas between the stations at the low points on the graph.

The stations without well developed commercial cores or good shopping centers (Westmont, Clarendon Hills, Highlands and Hollywood) are in general below the average or trend line for other centers but are, nevertheless, higher in residential land values than areas without stations adjacent to them.

The *cross sections* graph is a block-by-block representation along one street in each of the villages of Western Springs, La Grange and Riverside. It emphasizes the pyramid effec- of residential land values referred to pret viously, but it reveals other value configurations lost at the smaller scale of the block diagram. The railroad actually runs in a value trough or valley extending about one-quarter mile on each side of the tracks. Residential land values rise sharply to plateaus on both sides of the rail line about one-half mile from the railroad then drop sharply about one to one-and-one-half miles from the tracks. It would seem that people are willing to pay a premium to live at least one-quarter mile but not more than one-and-one-half miles from the railroad.

The *longitudinal sections* graph has been compiled from quarter section average residential land values one-and-one-quarter miles on each side of the railroad integrating a reasonable cross section into each point on the graph. When a straight line is adapted to this graph by statistical methods the downward trend in residential land values from east to west, from the city outward, is evident. The vertical lines on the graph each represent three minutes running time, on the average, for all suburban express





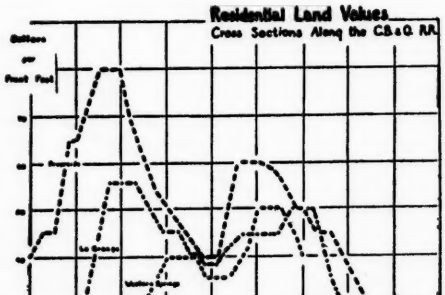
trains serving those stations. If the value at each intersection of the trend line with a three-minute-section line is picked off the graph and all these values averaged it is discovered that residential land values decrease, on the average, one dollar a front foot for every minute of average suburban express train running time from Cicero to Downers Grove.

Suburban Residential Land Values And Industrial Areas

The areas marked industrial on the *block* diagram are developed factory centers or industrial areas. Almost without exception residential land values are depressed within about one-half mile of these industrial centers. There is, however, an apparent advantage in that again almost without exception residential land values are higher than normal about one-half to one-and-one-half miles distant from the factories. Apparently people wish to live at least one-half mile but not farther than one-and-one-half miles from work. This phenomenon is strong enough to negate locally the effects of public transportation lines on residential land values.

Suburban Residential Land Values and Topography

Homer Hoyt points out that shorelines and higher points of land are preferred as places of residence. Patterns revealed by this investigation bear this out.[5] On the *block* diagram note that the areas immediately adjacent to stream valleys are depressed in residential land values while the areas about one-half mile distant are higher in value than is normal for their location with respect to



public transport. Very likely it is the banks above the stream or river valleys that assume the higher values as preferred residential lots while the lower swampier land in the valleys is shunned as a site for residential building.

[5] *op. cit.*

Conclusions

This is not an attempt to generalize on the basis of an investigation covering only one small geographic area. However, the conclusions reached here may very well be adaptable to any continuous urbanized suburban area connected to its metropolis by efficient rail service. For example:

One: suburban rail service connecting continuous urbanized areas runs in an area of high residential land values relative to areas without such service or some distance away from such service.

Two: the actual point-to-point values form, however, a jagged line with peaks close to the stations and dips between the stations. Residential land values, then, are in the form of a rough pyramid around each station with the apex at or near the suburban station. Land values are, however, depressed for about one-quarter to one-half mile each side of the tracks parallel to the railroad right of way.

Three: there is a trend in residential land values. The trend is downward going away from the city and is proportional to the distance (time) from the city in an observable ratio (in this area one dollar per front foot, on the average, for every minute of average suburban express train running time).

Four: residential land values are depressed within about one-half mile of industrial areas but are elevated from one-half to one-and-one-half miles distant from the industrial areas.

Five: residential land values tend to be elevated along stream or river banks but tend to be depressed in the stream or river valleys.

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The Utah Industrial Story: An Orientation of Industry to Minerals

IN the postwar years following World War II, industrial activity in the United States climbed to, and surpassed, any level of economic endeavor which hitherto had obtained. The magnitude of this intensified industrial expansion is best explained by a comparison of business expenditures for new plants and equipment over a decade. Thus, business expenditures for new plant and equipment approximated 6.5 billion dollars in 1940, in 1950 the figure was almost $18 billion, while for 1952 total expenditures in this category exceeded the 25 billion dollar mark.

One of the most interesting aspects of this expansion is the uneven expansion of industrial activity in the various parts of the country. Since the beginning of World War II over two million southerners have gone to work in new plants which were erected in the South through the medium of the billions of dollars invested in that area. The Pacific Coast has also experienced industrial expansion at a rate which has exceeded that of other areas of the country. In both the South and on the Coast, the industrial growth has been closely related to the expansion in the market potential of region, i.e., the enlarged market has acted as a focus or magnet for new manufacturing units which have been attracted by the "pull" of the buying power exerted by consumers in these states.

There are various factors of location which induce industrial migration and initiation of industry. In addition to markets as an orienting factor, other influences include labor, raw and semi-processed materials, climate, power, tax and regulatory laws, and a few influences of a more minor nature. Possibilities for the minimization of production costs govern location for manufacturing enterprises.

The influences of materials as a force guiding location has been nowhere more evident than in the state of Utah. In a study of new manufacturing firms in Utah, the "pulling" power of materials was seen to dwarf that of all the other location forces combined.[1] In terms of labor employed by the new manufacturing firms in Utah, 92 percent of all the labor employed by the new firms is employed by firms which are oriented to materials.

[1] The major part of the data concerning industrial location in Utah was secured through interviews with officials and owners of the new enterprises of the state. The period of the study included the years of 1946 through April 1951. The author also secured information from officials of labor unions and civic leaders of Utah.

Most of the minerals needed in modern manufacture are found in the state of Utah although in the past these minerals have not been fully utilized. Over two hundred different minerals have been reported in the state. At the present time about forty-five of them have been commercially exploited. Illustrative of the versatility of the Utah resource base is the fact that the Geneva Steel plant secures all of its principal minerals from within the state.

In 1948 Utah ranked 14th among the states of the union in the value of minerals produced. Utah ranked second to Arizona in 1948 in the production of copper and annually produces about 30 percent of the copper mined in the United States or about 10 percent of the world's primary production. Other minerals in whose production Utah ranks high include molybdenum, radium, silver, gold, lead, and iron ore. Industrial orientation to materials occurs when such a location presents an opportunity to minimize production costs. The cost affected is that of transportation.

If a material is cheap, bulky, and loses a large portion of its weight or bulk in processing, it is customary to seek a location for processing near the source of the materials. Thus, sugar beet factories are found within a few miles of the beet fields, ore smelters are placed in close proximity to the mines.

Another factor of some import for material orientation is that of sequence of materials. In some lines of production it is a technological necessity to process in an immediate sequence. Examples of this are found in the metal-producing industries or in industries which process some by-product as it accrues.

Industries which are predominantly raw material users are usually located near those raw materials. This is evident in the mineral industries. The exception to this characterization is that of petroleum refining. Petroleum loses little weight in processing; hence, location is somewhat flexible between market and materials. Industries which utilize large amounts of some heavy or bulky semi-finished good or partly processed raw material locate, in many instances, near the source of those materials. Steel fabrication units find it advantageous to process near steel producing plants, refineries of metals locate near the smelters. In addition to the possibility of a saving in transportation costs, proximity to the source of materials permits a personal contact with the supplier of them. If materials are in short supply such a contact may prove imperative for continued operation. Utah's postwar industrial development illustrates well these generalizations on the orienting forces of materials.

The Utah Experience

The most important new manufacturing firm in terms of investment and number of workers employed is the Geneva Steel Corporation of Provo, Utah. The Geneva Steel plant, constructed for the government by the United States Steel Corporation, began operation in the spring of 1944, and from then until its war contracts were terminated, it produced 634,000 tons of ship plates and 140,000 tons of structural shapes and shell-steel billets. The bid of United States Steel Corporation was accepted by the War Assets Administration May 23, 1947, for the Geneva plant. At the present time production is geared to an annual production rate of over 1,640,000 net tons of steel ingots. The steel consists of rolled plates, wide strip in the form of hot-rolled coils, and structural shapes.

In 1924 the Columbia Steel Corporation erected a 450-ton blast furnace in Provo which was sold to the United States Steel Corporation in 1930. During the thirties U. S. Steel surveyed Utah as a possible place for the erection of a steel plant based on the raw materials of the state but the project was abandoned because the Rocky Mountain region by itself did not offer a sufficiently large market potential. Although there was a split of opinion among the directors of United States Steel in 1947 as to whether the West could absorb the Geneva plant production, it became evident that what could not be sold in the Rocky Mountain states could be sold on the Coast. Approximately 90 percent of the steel produced at the present time finds its way westward. The welfare of the Geneva company is irrevocably linked with the continued industrial development in the eleven western states.

The most important factors in locating steel plants are the costs of assembling the iron ore, coal, and limestone. The Geneva Steel Company's location was premised on the nearness to these three components. The ubiquitous clay, sand, and water, are so widely distributed that they have no effect on the general location of steel plants although

the particular site of a plant may be influenced by the supplies of water available.

The major iron ore deposits of Utah are about 230 miles south of Provo, limestone and dolomite are obtainable near Payson which is 35 miles from Provo, coal comes from the Sunnyside district, foundry sand is obtained in southern Utah, and water, a limited resource in the arid state of Utah, is obtained from the Deercreek Reclamation project. Of all the raw materials required, water is the one in relatively short supply for the Geneva plant.

When it was decided to place a steel-producing unit in the state, Utah was presumed to have an ample supply of labor. During the War the 9th Army Command and 13 military installations were serviced by Utah labor and it was thought that, in view of the temporary features of theses installation, labor for the plant would always be readily available.

The initiation of steel-making was not unopposed in the state. The Mormon Church feared that with the inception of operations in the new plant their peaceful valley would become a place of "honky-tonks" frequented by rough laboring men brought in from steel centers of the East. It is a matter of record that their fears have been groundless. Eighty-five percent of the workers are natives of Utah. Many are small farmers of the valley who maintain small scale agricultural operations along with their work in the mill.

The Geneva operations have in turn led to a number of steel fabricating units seeking Utah locations in order to reduce transportation costs on steel produced at Geneva. The Chicago Bridge and Iron Company and the Commercial Shearing and Stamping Company of Youngstown, Ohio, two large fabricators of steel, are among those who have initiated operations in the Salt Lake City area. The vice president and treasurer of the Youngstown company said: "Right here at the door of the Geneva steel plant our company feels that we are in a most favorable location to serve the entire West. When you consider that we can save our purchasers possibly $14 a ton on their finished products in freight charges, that means a lot. For example, tank heads for huge gasoline units can be shipped any place in the West from Salt Lake City."

Observers of the steel fabricating industry in Utah agree that the lower costs resulting from the saving in transportation charges are passed on to the buyer of the fabricated product because of the intense price competition in the eleven western states. It is difficult for a non-area fabricator to meet the competition of the Utah firms in the intermountain area because of the great distances into the area.

Another Utah material which has attracted new firms is gypsum. In the production of gypsum products it is not economically feasible to locate the processing plant at any site other than the source of the materials. The gypsum itself is a low priced, heavy, bulky, commodity. The rock is quarried, ground exceedingly fine by rollers, and then placed in calcining kettles where the water of crystallization is driven off by heat. The Utah deposit of gypsum is one of the purest deposits known. This covering of earth over the gypsum is only about four inches in depth with a supply available for probably fifty years. The two new gypsum processing plants in Utah are located in the immediate vicinity of the material. The use of gypsum in public construction was popularized by the federal government during the War when wood was in short supply. Thus, contractors became familiarized with the use of gypsum and found it superior in many ways to other building materials. The Sigurd plants operate seven days a week, twenty-four hours a day. The Western Gypsum Company produces over 100,000,000 square feet of gypsum products annually. The Utah gypsum products are sold in the eleven western states.

Another large scale enterprise which found the Utah postwar economic climate salubrious, is the $16,000,000 Kennecott Copper Refinery of Salt Lake City. This refining operation completes the cycle of the four primary operations necessary to produce copper for sale, i.e., mining, milling, smelting and refining. The plant refines about 15 percent of all the new copper produced in the United States. Prior to the inception of operations by the plant, smelter production occurred in Baltimore, Maryland, and Perth Amboy, New Jersey. The location in Utah effects an important saving in transportation costs for western and midwestern users of copper. Prior to the war, the great users of copper in the United States were located in the East. The growth of the western market made possible the establishment of this multi-million dollar plant.

The Filtrol Corporation of Salt Lake City, which manufactures catalytic agents used by oil refineries, oriented its location in the area not to one material, but to two. The company utilizes halloysite clays obtained from Ureka, Utah and approximately 3,000 tons of sulphuric acid monthly from the Garfield Manufacturing and Chemical Company of Salt Lake City. The weight of these two materials, the clay and the acid, is greatly reduced in the productive process, hence, with a nationwide market, a site near the materials reduces transport cost by an amount sufficient to govern location.

Another processing unit which must be located at its source of raw materials is that of the Salt Lake City Stansbury Salt Company which processes salt for industrial and agricultural uses. The plant is located on the west side of the Great Salt Lake which contains about 75 percent salt by volume. The water from the lake is pumped into ponds where the water is removed by solar evaporation.

Although the orienting force of the materials was not as strong as for many of the postwar firms, the Salt Lake City Refinery and Pipe Line Corporation of the Standard Oil of California was oriented to a Utah location. Petroleum refineries are usually located near their markets or sources of raw materials. The raw petroleum loses little weight in the refining process, hence, the incentive to locate at the source of the petroleum is not particularly strong. The refinery was established in Salt Lake City to "provide a demand for the wells in the Rangely Field." Prior to the War, oil from the Rangely Field had flowed East rather than West. It was not until after the War that oil production in the Rangely Field in northwest Colorado was undertaken on a large scale.

Conclusion

The location processes of these firms illustrate vividly the orienting force of materials. It is through its minerals, for the most part, that Utah attracts new industry. In the five years following the War over 130 millions of dollars found its way into the state in capital investment in manufacturing plants. The bulk of this investment was in manufacturing which was drawn to Utah minerals.

In the years prior to the War the lack of a market capable of absorbing new mineral products acted as a strong deterrent to industrial expansion in this Rocky Mountain state. The growth of the Pacific Coast in population and industry has made possible the exploitation of Utah minerals on a scale heretofore undreamed of.

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Book Reviews

The Business Law of Real Estate. By Gerald O. Dykstra and Lillian G. Dykstra. New York: The Macmillan Company, 1956, pp. xii, 852. $7.50.

The authors' preface to this book states: "The two-fold purpose herein is to supply a volume suitable for student use in a Real Estate Law course and as a reference book for laymen in those professions and occupations where some knowledge of legal principles governing real property is essential." The authors have been most successful in accomplishing that purpose.

Throughout the volume there are presented the basic principles of law applying to the various subjects treated, together with the setting forth of the majority and minority views in those instances where the basic rule is not unanimous (and that appears to be the predominant situation at least in application of many of the basic principles among the various states); the theories upon which the rules are based are set forth and their development from one area into another is traced both as a result of changing conditions and new situations, i.e., development of the airplane and its attendant problems. Representative statutory approaches and solutions to particular situations are presented and the various subjects are further elucidated with a large number of recent widely-selected, well-chosen and edited cases. In addition, by the liberal use of foot-notes, in which there are listed various states adhering to different rules or differing applications of the same rule, the utility of the material presented has been enhanced and not limted by the fact that cases from each state on every question cannot be presented.

The material of the book is set forth in six parts: Part I, the Introduction, dealing with the nature and classification of property; Part II, Land and Estates Therein, treats with crops, fixtures and estates in lands; Part III, The Acquisition and Transfer of Title or Interest, is devoted to the installment land contract, deeds, leases, mortgages, adverse possession and easements, and embraces almost one-half of the 839 pages of the volume. This portion of the book together with Part VI, Real Estate Brokers, dealing with commissions and listing contracts, should be of particular interest and value to anyone engaged in the business of real estate as an agent or broker.

Part IV, Public and Private Restrictions on the Use of Land, deals with zoning ordinances, restrictive covenants and eminent domain, all of which are becoming increasingly important as a result of urban redevelopment, suburban living and the importance of easy movement by automobile, both for short and long distances.

Omitted from the material are the subjects of wills, trusts, descent, and administration of estates, and in lieu thereof the authors have included in Part V, Rights and Duties of Owners and Occupiers of Land, embracing material on adjoining landowners, trespass, nuisances, and the liabilities of the landowner in connection with his ownership. For the objectives this volume is designed to attain, this substitution of materials was wisely made. This volume should prove to be of value both for the business student and the layman if he has any interest at all in the subject of real estate.

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Introductory Economic Geography. By Lester E. Klimm, Otis P. Starkey, Joseph A. Russell, and Van H. English. New York: Harcourt, Brace and Company, 1956, x, pp. 707, $7.50. Under the general editorship of J. Russell Whitaker. 3rd edition. Previous editions of this book appeared under the authorship of Klimm, Starkey, and Hall.

This standard economic geography text, in its first new edition since 1940, is designed for a first-year integrated course in the de-

scription and analysis of man's economic activities. It is comprehensive enough to serve economic geography courses that emphasize products and industries as well as those that accent economic description of the world by regions. Although the emphasis is on a competent and thorough treatment of economic aspects of geography, the authors introduce the other elements of geography sufficiently well to give the individual with no prerequisite experience an adequate basis for understanding.

The volume is divided into four parts. The first section, occupying twenty percent of the book, is a concise and adequate coverage of the basic physical fields of geography and their relationships to man. This is followed by chapters discussing economic organizations and resource uses. The balance of the book is then devoted to world patterns of economic activities, first by industrial groups and then by major economic regions.

Individual chapters in the second part concerning resources and organization are devoted to the principles underlying the geography of trade and trade routes, raw materials, manufacturing, and cities. Part III, entitled "Representative World Industries," integrates raw material production with manufacturing throughout each of 14 major groupings of activities.

In the regional treatment of Part IV the world is divided into "large convenient segments, each of which has enough common economic characteristics to be considered as a whole." Each of these major regions is then broken into sub-regions defined either by commercial organization or by homogeneity of economic conditions. "The objective is to portray the economic characteristics of each area as accurately as possible within the available space. In most areas emphasis is placed not only on areas of production but on the channels of trade and on cities, the nerve centers of our modern economic world.'

As in previous editions, the authors have included a useful statistical appendix, a selected bibliography, and a detailed index. The illustrations, both maps and photographs, are numerous and well-selected. The chapters are characterized by a lack of formal stereotyping, each of them being organized according to the particular nature of the subject it treats.

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Coming in August 1957 issue of LAND ECONOMICS

China's Land Transformation and the USSR Model
.....*By* D. L. SPENCER *and* V. KATKOFF